Managing Insomnia

Beatrice B. Turkoski

Sleep is a vital part of normal health and wellness for everyone. It is also an important factor in recovering from the physiological and emotional stress of any hospitalization or illness. Insomnia—the lack of adequate period of sleep—has a profound impact on society and public health in many ways. Chronic insomnia contributes to injury and illness and may have adverse effects on cognitive functioning, interpersonal relationships, concentration, the ability to handle stress, and productivity. Nurses who are knowledgeable about the possible causes of insomnia, the different types of insomnia, and various therapeutic interventions will be able to identify those who have insomnia or are at risk of insomnia and will be able to counsel these patients about healthy sleep habits and the safe use of pharmacotherapeutic therapies used to treat insomnia.

"I can't ever seem to get to sleep at night." "I wake up every morning before the birds." "I don't sleep a wink." "I'm awake all night, just nap off and on until morning." "I know you didn't come in my room last night. I was awake all night and would have heard you." "I can't get any work done during the day. I'm always so sleepy." "Sorry Officer, I just fell asleep while I was driving." At any time, 35% of the population complains of insomnia and at least 10% of those report daytime effects that adversely affect mental function, interpersonal relationships, occupational stability, personal safety, and response to psychological or physiological stress.

Insomnia, the most common adult sleep disorder, is a problem of insufficient or nonrestorative sleep even when there is adequate opportunity to sleep. Often, it is associated with psychological problems or other health disorders (comorbid insomnia). However, insomnia can also be a primary disorder in itself (primary insomnia). It can be acute or chronic and can consist of one or more sleep problems, such as difficulty in falling asleep, difficulty maintaining sleep, waking too early, or nonrefreshing sleep.

Diagnosing insomnia is primarily based on a thorough sleep history. Although there are various forms of laboratory testing available, they are very expensive and are usually reserved for cases that involve sleep apnea. Nurses who understand the various forms of insomnia and are sensitive to obtaining and evaluating good sleep histories can be invaluable in identifying those individuals who have or are at risk for insomnia.

Treatment of insomnia involves teaching good sleep hygiene and the use of selected pharmacological interventions. Here again, knowledgeable nurses can play a major role, counseling people with insomnia about good sleep habits and educating people about how to safely use and evaluate their medications.

In the following discussion, a brief overview of the physiology of normal sleep is included as an introduction to recognizing and effectively treating insomnia. An overview of diagnosis and treatment options for insomnia is also included. Selected medications used to treat insomnia will be identified, including use cautions and patient education factors for each medication. A list of good sleep habits that can be used when counseling patients can be found in Box 1.

**Physiology of Sleep**

Sleep is divided into several stages that alternate between nonrapid eye movement (NREM) sleep and rapid eye movement (REM) sleep. NREM sleep is restful and restorative. It is characterized by slow brain waves, decreased vascular tone, respirations, heart rate, and blood pressure and occurs in four stages of increasing depth. Stage 1 lasts for a brief few minutes of relaxed wakefulness that acts as transition from wakefulness to sleep. Approximately half of total sleep time is spent in stage 2, a deeper sleep also known as alpha rapid-wave sleep. Stages 3 and 4, or delta sleep, involves the deep, restorative sleep time during which immune function is fortified and growth hormone is secreted. REM sleep, which is characterized by rapid eye movements, highly active brain waves, increased heart rate, respirations, and blood pressure, occurs in periods varying from 5 to 30 minutes approximately every 90 minutes. The first REM cycles are very short, but gradually, as the sleep cycles repeat and the body becomes more rested, the period of REM sleep becomes longer; stages 3 and 4 disappear and the body alternates between longer period of REM and stage 2 NREM sleep (Guyton & Hall, 2006).

Although disruptions in any stage of sleep may result in different effects on the sleep pattern (for example, inadequate or disturbed stage 1 sleep can result in an inability to
**Box 1. Eight Tips for Improved Sleep Health**

The following suggestions may help you achieve more restful sleep. They are guidelines that may be adapted to your life-style and environment when you have difficulty falling asleep or awaken frequently from sleep.

1. **Develop and maintain a regular bed time and wake schedule.**
   Setting a regular pattern for sleep and waking strengthens a regular circadian rhythm. Sleep only as long as necessary to feel refreshed; sleeping too long may upset the sleep onset at night.

2. **Establish a regular, relaxing bedtime routine.**
   A relaxing routine followed regularly before bedtime distinguishes sleep time from the non-sleep activities. Relaxation promotes restful sleep. If you find that stress or anxiety prevents you from falling asleep relaxation therapy may help. Avoid bright lights before bedtime; bright light signals the circadian clock that it is time to wake up.

3. **Avoid heavy, spicy foods close to bedtime.**
   Heavy meals may make you less comfortable when settling for bed, spicy food have a tendency to cause heartburn which can make it difficult to fall asleep and can cause discomfort during the sleep period.

4. **Restrict excessive fluids close to bedtime.**
   Warm milk or decaffeinated teas may be soothing for some people as part of a bedtime routine. However, excess fluids may result in wakening to go to the bathroom during the night.

5. **Avoid alcohol, caffeine, and nicotine close to bedtime.**
   Alcohol disrupts sleep and causes nighttime wakenings. Caffeine and nicotine are stimulants and may make falling asleep more difficult.

6. **Create an environment that is conducive for sleeping.**
   A room that is neither to warm or too cold, dark, quiet, comfortable and free of interruptions helps establish conditions that are conducive to sleep and separates the sleeping room from other rooms where non-sleep and stimulating activities take place. Move the clock from sight if looking at the clock makes you anxious about how long you have been awake or how soon you must get up.

7. **Have comfortable bedding.**
   A comfortable mattress and pillows support the body in alignment during sleep and reduce cramping and back discomfort that disrupts restful sleep.

8. **Use the bedroom only for sleep and sex (not work).**
   Removing work materials such as desks, computers, briefcases, telephones, etc. from the sleep environment establishes a distinct separation from the area for sleep and the areas for work. If you wake and cannot sleep do something outside of the sleeping room.

---

*Adapted from National Sleep Foundation “Healthy Sleep Tips” (2006).*

---

fall into a deeper sleep), both NREM and REM sleep are essential for rest, rejuvenation, and the maintenance of overall health. It is loss of total sleep time rather than selective sleep stage deprivation that is the most important predictor of adverse cognitive effects (Porth, 2006).

---

**Insomnia**

Insomnia is defined as a lack of sleep that occurs when there is adequate and normal opportunity to sleep (differentiating insomnia from sleep deprivation that occurs with circadian rhythm disturbances such as time zone changes or shift work). The type of sleep disturbance and the duration of the problem classify insomnia. The type of sleep disturbance may be because of a problem with sleep onset (getting to sleep), difficulty in maintaining continuous sleep (remaining asleep for the time necessary for renewal and refreshment), or waking up too early (National Institutes of Health [NIH], 2005). The duration of the insomnia determines whether it is considered acute or chronic. Acute insomnia can occur in anyone and lasts for a relatively short time (less than 30 days), and can reoccur for short periods of time when “triggered” by transient events (primarily stress). Chronic insomnia lasts longer than 30 days and has a more extended impact on an individual’s daytime function. Women are more prone to insomnia than men (especially during menstruation or menopause when the menstrual cycle causes changes in hormones), and complaints of insomnia increase with age (NIH; Porth, 2006).

Chronic insomnia can occur as a primary condition. However, it often exists with other conditions and can exacerbate those conditions. Psychiatric disorders, such as depression or generalized anxiety, and physical problems that cause pain, immobility, or changes in cardiovascular, gastrointestinal, or respiratory impairment can coexist with insomnia. However, there is little support for assuming that insomnia will improve if the other disorders are relieved or go into remission (NIH, 2005).

Although there is a paucity of research that clearly identifies measurable consequences of different types of insomnia or specific consequences within different aggregates of people, it is known that insomnia is associated with adverse daytime functioning and decreased quality
of life. Several studies have indicated a relationship between chronic insomnia and impaired work performance, work days missed, and impaired cognitive function. Daytime sleepiness may also make people with insomnia more prone to have driving accidents, although there have been few studies to support a direct correlation (NIH, 2005).

**Diagnosing Insomnia**

The first step in diagnosing insomnia is obtaining a detailed sleep history. Determining the nature and the duration of insomnia includes questions such as "How long does it take you to fall asleep?" "How long are you able to maintain sleep?" "How do you feel the next day?" These questions are all necessary in developing an individualized treatment plan. It is also important to ascertain how long insomnia has been a problem; it may be a self-perpetuating problem when a patient worries about getting enough sleep so much that the concern about sleep actually causes additional sleep-disturbing stress (see Box 2 for suggestions for a sleep history).

Identifying and evaluating other health problems also can be used to identify patients at risk of developing insomnia; for example, those who have conditions that are known to coexist with insomnia. Patients with comorbid conditions may have a tendency to not recognize symptoms of insomnia but rather to blame the coexisting problem for frequent wakings or unrestful sleep. For instance, someone with severe arthritis may think that sleep disturbances are a normal part of arthritis and not complain of the sleep problems.

A careful evaluation of any prescribed medications, over-the-counter products, or herbal remedies is necessary. Medications commonly causing insomnia include beta-blockers, alpha-methyl dopa, phenytoin, monoamine oxidase inhibitors (MAOIs), bronchodilators, central nervous system stimulants, and weight loss medications. Adjusting the administration time of some medications or stimulants may be all that is necessary to avoid insomnia. Use of alcohol (amount and time of consumption) is an important part of evaluating insomnia; alcohol acutely disrupts normal sleep, especially when taken shortly before retiring.

Waking with sore limbs and an overall less restful sleep can signify restless leg syndrome (RLS) or periodic limb movement during sleep (PLMS). Frequent wakenings accompanied by gasps for air may indicate sleep-disordered breathing or sleep apnea. Such more serious sleep disorders require assessment and treatment by a sleep specialist. Objective assessment of sleep by a family member or bed partner often provides valuable information because individuals with chronic insomnia can underestimate or overestimate the amount of sleep they get and the time it takes them to fall asleep. Assessing functional ability associated with insomnia before and after treatment is essential in measuring the success of each therapeutic intervention.

A sleep log may be of value when assessing insomnia. This 2-week diary of an individual's assessment of his or her sleep habits should identify bedtime, routine for sleep preparations, time it takes to fall asleep, wake time, any wakening during the sleep period and its reason for it (hunger, toileting, restlessness, etc.), any medications used, and subjective assessment of sleep quality as well as any daytime naps.

**Management of Insomnia**

Treatment options for acute or transient insomnia may include behavioral interventions and short-term use of pharmacotherapeutics or a combination of both. According to some experts, behavioral change is the first step toward breaking maladaptive sleep habits (Smith & Perlis, 2006). When interventions such as keeping a regular sleep schedule, creating a dark, comfortable bedroom environment, and establishing a prebedtime ritual are effective, insomnia can be resolved without the expense of drugs or side effects of the drug (see Box 1 for sleep health suggestions).

With chronic insomnia, behavioral interventions, tailored to the individual patient, may include stress reduction, music therapy, or relaxation therapy. Prescription medication therapy may also be used for a short time at the beginning of treatment or periodically during treatment (Vallieres, Morin, & Guay, 2005). Long-term use of sleep medications for chronic insomnia may cause dependence and increase the potential for adverse side effects.

**Insomnia Medications**

Eight benzodiazepine receptor agonists have been approved by the Federal Drug Administration (FDA) for treating insomnia: five selected benzodiazepines and three nonbenzodiazepine hypnotics. However, off-label use of some sedative antidepressants and other sedating medications (barbiturates and antipsychotics) is also prevalent. In the following discussion, approved hypnotics and several commonly used sedatives are discussed. Use cautions are addressed, and patient education content is identified for these drugs. Two frequently used nonprescription products will also be identified. (Note: the references for the following information include Katzung (2003), Krinsky, LaValle, Hawkins, Pelton, and Willis (2003), and Turkoski, Lance, & Bonfiglio (2006)).

**Hypnotics**

Defining efficacy for a hypnotic drug is very difficult because efficacy is patient-dependent. Thus, it is very important that a patient is educated about realistic expectations for effectiveness; this may prevent independent dose escalation, which increases the risk of adverse effect. Hypnotic effectiveness, especially with traditional hypnotics, will not result in a rapid onset of unconsciousness that is uninterrupted for 8 hours. A hypnotic is effective if it facilitates sleep that is both restful and restorative and allows usual functioning while awake. Normal sleep consists of some nights with occasional interruptions in sleep and some nights with 6 instead of 8 hours of sleep. A sleep log is a valuable aid when first using a hypnotic or when changing from one drug to another. This allows both patient and clinician to see averages over time. (Without a diary, patients typically remember...
Suggestions for Inclusions in Sleep History Information Forms

1. Describe your sleep problem in as much detail as you can.
2. Is this a new problem?
3. How long has this been a problem? Is this every day or is there a pattern you can identify?
5. What hours do you work?
6. On the days you work: What time do you go to bed? How long does it take you to get to sleep? Do you have trouble falling asleep? Do you wake during the sleep period? How often? How long are you awake? Is there a reason that you wake during the sleep period? If so, what disturbs your sleep? (eg. pain, hunger, thirst, urination, worry, dreams) How long do you sleep? (not how long you spend in bed awake) What time do you get out of bed? Do you feel rested when you get out of bed or are you still sleepy? How long does it take you to fully wake after you get up? Do you chronically feel sleepy, fatigued or tired when you are “supposed” to be awake? Do you ever feel sleepy while driving? How many naps do you take other than regular sleep hours?
7. On the Days you do not work: What time do you go to bed? How long does it take you to get to sleep? Do you have trouble falling asleep? Do you wake during the sleep period? How often? How long are you awake? Is there a reason that you wake during the sleep period? If so, what disturbs your sleep? (eg. pain, hunger, thirst, urination, worry, dreams) How long do you sleep? (not how long you spend in bed awake) What time do you get out of bed? Do you feel rested when you get out of bed or are you still sleepy? How long does it take you to fully wake after you get up? Do you chronically feel sleepy, fatigued or tired when you are “supposed” to be awake? Do you ever feel sleepy when driving? How many naps do you take other than regular sleep hours?
8. Grade your tendency to fall asleep during the following
   (0 = never, 1 = slight, 2= moderate, 3 = high)
   Reading  Watching TV  Theater, meeting, or movie  As passenger in a car
   Sitting quietly alone  Sitting visiting with someone else
9. Do you have a regular routine to prepare for sleep? If so, please describe in detail?
   (eg. warm milk, warm bath, music, alcohol, take a walk, etc.)
10. Tobacco use (yes/no) Per day? How long? Time of day of your last use?
11. Alcohol use (yes/no) How many drinks per day/week/month? Time of day of last drink?
12. Caffeinated beverages (yes/no) How many per day? Time of day of last drink?
13. Any history of sleep walking, nightmares, snoring, talking in sleep, grinding teeth?
14. Any family history of sleep problems? (If yes, please describe)
15. Current medications, reason taken, how long taken (including all prescription and OTC medications as well as all herbal substances and anything taken for sleep).
16. Personal medical history.
17. Family medical history.

only their worst nights of sleep difficulty, which can lead to unnecessary increases in dosage).

1. Benzodiazepines: Estazolam (ProSom); Flurazepam (Dalmane); Quazepam (Doral); Temazepam (Restoril); Triazolam (Halcion)
   Benzodiazepines have hypnotic, muscle relaxing, antianxiety, and anticonvulsant properties. They do not necessarily increase sleep time but may enhance patients' perceptions of longer sleep duration. The benzodiazepine (BZD) receptors involved with hypnotic efficacy are known as omega-1 and omega-2. The BZD-1 receptors are located in areas of the brain that are involved in sedation, and BZD-2 receptors are highly concentrated in areas responsible for cognition, memory, and psychomotor functioning. Although hypnotic efficacy may not differ between benzodiazepines and the newer selective agents (see below), the nonbenzodiazepine drugs theoretically should have less central adverse effects on cognition, memory, and psychomotor function.

☐ Use cautions: For short-term use. Should be used only after full evaluation of potential causes of sleep disturbance. Long-term use can result in dependence, abuse, or tolerance; evaluate periodically the need for continued use. When discontinuing after long-term, use taper dose slowly.
Onset of action and duration of effect differ among these agents: Flurazepam offers a rapid onset of effect but a long duration of effect (it has an active metabolite with a half-life of up to 5 days). Temazepam has a half-life of 8–20 hours and triazolam has 2–6 hours. Temazepam has the disadvantage of a slow onset of effect compared with flurazepam and triazolam. Estazolam is most similar to temazepam; it has a slow onset of effect of 1–2 hours and an elimination half-life of 8–24 hours. Quazepam is rapid-acting drug with specificity for the omega-1 benzodiazepine receptor. However, the active metabolite of quazepam is N-desalkyl-flurazepam, the same active metabolite as flurazepam and half-life is between 40 and 114 hours. The benefits of the shorter half-life drugs on next-day performance are counteracted by the increased risk of rebound insomnia and new memory impairment (anterograde amnesia) that is not commonly seen with the longer half-life drugs. These effects can be minimized by use of the minimum effective doses; dose is the most important determinant.

- **Pregnancy:** All BZDs may cause severe fetal defects and are to be avoided during pregnancy—PRF X. All are not recommended for lactating mothers.

- **Drug/drug interactions:** All BZDs have potential for multiple drug/drug interactions, especially additive CNS and respiratory depression with other CNS depressants; CYP4A inhibitors (e.g., azole antifungals, ciprofloxacin, clarithromycin, doxycycline, izonidizid, nicardipine) may enhance levels or effects of benzodiazepines; drugs that may decrease levels or effects of benzodiazepines include nafillin, phenobarbital, rifamycins, theophylline, and some oral contraceptives. Avoid St. John’s wort, valerian, kava kava, and gogu kola (may increase CNS depression).

- **Adverse effects:** Adverse effects are patient specific but include the potential for drowsiness, dizziness, confusion, memory impairment, motor incoordination, depression, headache, nervousness, and hallucinations (temazepam—diarrhea, nausea, vomiting).

- **Patient education:** Use exactly as directed; do not increase dose or frequency or discontinue without consulting prescriber; this may cause physical or psychological dependence. Avoid alcohol. Do not take any prescription or OTC medications (especially pain medication, sedatives, antihistamines, or hypnotics) without consulting prescriber. You may experience drowsiness, dizziness, and blurred vision (use caution when driving or engaging in tasks that require alertness until response to drug is known). Report any CNS changes (confusion, depression, daytime sleepiness, excitement, headache, abnormal thinking, nightmares, and so on); respiratory difficulty, chest pain, or palpitations; altered gait or stumbling; or other persistent adverse effects. May cause fetal defects; do not get pregnant during or for 1 month after discontinuation of therapy.

- **Nonbenzodiazepine hypnotics:** Zolpidem (Ambien); Zaleplon (Sonata); Eszopiclone (Lunesta), Ramelteon (Rozepam).

Several of these products have been highly advertised in public and professional media. However, their use, as with any other prescription for insomnia, requires a thorough assessment of the sleep problem and should be accompanied by counseling about any maladaptive sleep habits.

Zolpidem, Zaleplon, and Eszopiclone interact with the omega-1 BZD receptor that affects sedation so that there are no anticonvulsant or muscle relaxant properties. Rebound insomnia, memory impairment, dependence, and withdrawal are uncommon. All have rapid onset and should be administered at bedtime. All have shorter elimination half-lives than BZD and may mean less daytime hangover or sedation effects. Eszopiclone is absorbed rapidly, peaks in 1 hour, with a half-life of 6 hours. Zolpidem has an onset of action 30 minutes, with a duration of action for 6–8 hours. Zaleplon peaks in 1 hour, with duration of action for 6–8 hours. Ramelteon is a selective agonist of melatonin receptors MT1 and MT2 and is thought to induce sleepiness and influence regulation of circadian rhythms. Onset of action is 30 minutes and half-life elimination is between 2 and 6 hours.

- **Use cautions:** Zolpidem and Zaleplon are approved for short-term use only (10–14 days).

Eszopiclone has been approved for use up to 35 days. All these drugs have the same cautions for potential abuse and dependency (especially with patient’s who have a history of addiction or dependency) and possible worsening of depression (including ideation) in patients with preexisting depressive or psychiatric disorders. Anterograde amnesia is not a notable adverse effect of these drugs.

- **Pregnancy:** Pregnancy risk factor C.

- **Drug/drug interactions:** All may have additive CNS and respiratory depression with other CNS depressants. Similar to the benzodiazepines, CYP3A4 inducers may decrease effects and SYP3A4 inhibitors may increase levels or effects of Zolpidem, Zaleplon, and Eszopiclone. CYP1A2 inhibitors such as amiodarone, ciprofloxacin, fluvoxamine, and ketoconazole may increase levels/effects of Ramelteon.

- **Adverse effects:** Adverse effects are patient specific but include the potential for residual daytime sedation, cognitive impairment, and motor incoordination. Frequency and severity of rebound insomnia is lower than BDZs because of the shorter half-lives.

- **Patient education:** Take exactly as directed, immediately before bedtime. Do not alter dosage or frequency: may be habit forming. Avoid alcohol and other prescription or OTC medications (especially medications to relieve pain, induce sleep, reduce anxiety, treat or prevent colds, coughs, or allergies) unless approved by your healthcare provider. You may experience drowsiness, dizziness, somnolence, vertigo, lightheadedness, and blurred vision (avoid driving or activities that
require alertness until response to drug is known. Small frequent meals, good mouth care, or sucking lozenges may help if you experience nausea. Report any CNS changes (confusion, depression, anxiety, excitement, headache), respiratory difficulty, or other adverse effects.

3. Sedatives (sedating antidepressants): Amitriptyline (Elavil), Doxepin (Sinequan), Nortriptyline (Pamelor), Trazadone (Desyrel)

Sedating antidepressants have been used to induce sleep in doses lower than those generally used for depression in an attempt to avoid the benzodiazepine liabilities of dependence, rebound insomnia, and withdrawal effects. In fact, in the NIH survey, antidepressants (primarily trazadone) appear to be more commonly used than the older benzodiazepines, especially for patients with comorbid depression or anxiety (NIH, 2005). The sedating antidepressants reduce anxiety and exert calming effect with less affect on motor or mental function. Amitriptyline, Doxepin, and Nortriptyline are all tricyclic antidepressants (TCAs) and Trazadone is a serotonin reuptake inhibitor.

- **Use cautions:** Although the use cautions for TCAs and serotonin reuptake inhibitors differ somewhat, all antidepressants carry FDA mandated warnings about suicidal ideation or unusual changes in behavior, especially during initiation of therapy or when changing dosage. Caution should be used with history of cardiovascular disease (e.g., recent myocardial infarction, stroke, tachycardia, or conduction abnormalities) or with history of seizure disorders (may lower seizure threshold). Overdose is a major concern with all antidepressants, although Trazadone has less danger than the TCAs.

- **Pregnancy:** Amitriptyline, Doxepin, and Trazadone are PRF C; Nortriptyline is PRF D.

- **Drug/drug interactions:** The TCAs and serotonin reuptake inhibitors each has multiple different drug/drug interactions that have the potential for increasing levels/effects of either concurrently used drugs or the sedative antidepressants used to treat insomnia. Common interaction potentials among these drugs include the increased effects of concurrently used CNS depressants (sedatives, hypnotics, ethanol), increased potential for serotonin syndrome with other serotonergic agents (e.g., MAOIs), and increased effects of amphetamines. Grapefruit juice may inhibit metabolism of TCAs with resulting toxicity. St. John's wort, valerian, kava kava, gofu kola may increase CNS depression.

- **Adverse effects:** All these sedating antidepressant all have the potential for weight gain, constipation or diarrhea, headache, dizziness, prolonged drowsiness, and possible orthostatic hypotension. TCAs have a noticeable anticholinergic effect, a greater potential for orthostatic hypotension, and a potential for possible cardiac complications or seizures. Priapism is a rare but serious adverse effect of trazadone, and male patients should be counseled about the possibility of this effect.

- **Patient education:** Take exactly as directed. Do not increase or change dose; it may take 2–4 weeks to achieve the desired results. Avoid excessive alcohol or caffeine. Do not use new prescription, OTC, or herbal products unless approved by the prescriber. You may experience drowsiness, dizziness, and blurred vision (use caution while driving or when engaged in tasks that require alertness until response to drug is known), orthostatic hypotension (rise slowly from lying or sitting position and use caution when climbing stairs), or constipation (increased exercise, fluids, or dietary fiber may help). Report palpitations, chest pain, or irregular heartbeat; thoughts of suicide or changes in thought processes; or other persistent adverse effects.

### Nonprescription Sleep Aides

Most people will have tried one or more home remedies or nutraceutical products before they seek professional help for insomnia, and others may just prefer to use a nonprescription product. Informed healthcare professionals will be able to counsel patients on the safe use of these products. Two of the more commonly used products are valerian and melatonin.

#### Valerian

Valerian is derived from the root of the plant species valeriana. It is not regulated by the FDA, and different preparations may vary as to content. Essentially there are three chemical actions of valerian; one has a direct sedating effect, one has a central nervous system sedating effect, and one acts to relax muscles in the gastrointestinal system.

- **Use cautions:** All other medications and natural products should be checked with a professional (may not mix well with other products); should not be used in children younger than 12; should not be used in patients with a history of seizures. Should be avoided in pregnancy and lactation because there are no effective study results.

- **Adverse effects:** Drowsiness, lightheadedness, blurred vision, morning drowsiness or sedation, or rare allergic reaction.

- **Patient education:** Talk with healthcare provider about possible interactions with other prescription or nonprescription products you are taking. Take with full glass of water 30–60 minutes before bedtime. Intermittent schedule (4 weeks on and 2 weeks off) is recommended. If dose is missed, do not take double doses. Avoid alcohol or other medication that slows your actions or reactions. You may experience drowsiness, lightheadedness, and blurred vision (use caution or avoid driving or engaging in tasks that require alertness until response to medication is known). If morning sedation or excess drowsiness exists, adjust amount of product taken. Contact healthcare provider if you experience any life-threatening reaction (wheezing, chest tightness, fever, itching, unusual cough, blue skin color, swelling of lips, tongue, or throat), changes in thinking clearly or logically, severe headache, and unusual and persistent nausea or vomiting or diarrhea.
Melatonin

Commercially prepared supplements are synthetically prepared versions of the naturally occurring pineal gland hormone melatonin. Natural melatonin regulates the normal sleep/wake cycle and aids in regulating the secretion of growth hormone and gonadotrophic hormones (Ahrendt, 2000). As a supplement, melatonin has both phase-shifting and sleep-promoting properties. Adults between 20 and 70 years of age experience about a 37% decline in daily melatonin output. Melatonin has been used effectively to reduce circadian rhythm disturbance caused by rapid time zone changes (jet lag) or shift work changes. The only current FDA approval is for treatment of circadian rhythm sleep disorders in blind people with no light perception. Use is fairly common in short-term insomnia; however, there is little information about effectiveness for chronic insomnia.

- **Use cautions:** Caution should be used with transplant recipients, those who have an autoimmune condition, have a history of estrogen-dependent tumors, endometrial cancer, stroke or thromboembolic disease, and those who are taking immunosuppressants, or receiving hormone therapy (oral contraceptives, hormone replacement therapy). Effects on fetus not known; should not be used during pregnancy or while breast-feeding. Excessive dosages may cause morning sedation or drowsiness.

- **Drug/drug interactions:** All other medications and natural products should be checked with professional (numerous other medications may interfere with melatonin synthesis). Effects may be additive with medications that cause CNS sedation, including alcohol.

- **Adverse effects:** Potential for drowsiness, light-headedness, blurred vision, morning drowsiness, or sedation.

- **Patient education:** Consult healthcare provider before taking if you are pregnant or breast-feeding. Are a transplant recipient, have an autoimmune condition, a history of estrogen-dependent tumors, endometrial cancer, stroke, or thromboembolic disease. Discuss all other prescription and nonprescription medications you are taking with your healthcare provider. Take 30–60 minutes before bedtime. If dose is missed, do not take double doses. You may experience drowsiness, light-headedness, and blurred vision (rise slowly from sitting or lying position, use caution when climbing stairs, and avoid driving or engaging in tasks that require alertness until response to medication is known). If morning sedation or excess drowsiness exists, adjust amount of product taken. Contact healthcare provider if you experience any life-threatening reaction (wheezing, chest tightness, fever, itching, unusual cough, and swelling of lips, tongue, or throat), changes in thinking clearly or logically, or other severe adverse effects.

**Conclusion**

As the National Institute of Health has determined, there is much we need to learn about insomnia, the etiology and effects of insomnia and the effectiveness of the wide variety of behavioral therapies and pharmacotherapeutics used to treat insomnia (NIH, 2005). This discussion has presented a very brief review of current understanding of insomnia and addressed a selected representation of the more common therapeutic interventions in current use. Nurses can use this knowledge to identify at-risk patients and educate patient with insomnia about nonpharmacological interventions that may change the sleep disturbance pattern. For those who are currently taking or are considering using pharmacological treatment for insomnia, knowledgeable nurses can teach the safe and therapeutic use of such agents. (For those interested in further patient information about insomnia see the list of WWW resources.)

**WWW Resources for Patient Information about Insomnia**

- [http://www.sleepfoundation.org](http://www.sleepfoundation.org)—The National Sleep Foundation is an independent nonprofit organization that supports public education about sleep disorders.
- [http://www.4woman.gov/faq/insomnia.htm](http://www.4woman.gov/faq/insomnia.htm)—The USDHH site for National Women’s Health Information Center.
- [http://www.nhlbi.nih.gov/sleep—National Institutes of Health—National Center on Sleep Disorder Research](http://www.nhlbi.nih.gov/sleep—National Institutes of Health—National Center on Sleep Disorder Research)

**REFERENCES**


Managing Insomnia

Instructions:
- Read the article on page 339.
- Take the test, recording your answers in the test answers section (Section B) of the CE enrollment form. Each question has only one correct answer.
- Complete registration information (Section A) and course evaluation (Section C).
- Mail completed test with registration fee to: Lippincott Williams & Wilkins, CE Group, 333 7th Avenue, 19th Floor, New York, NY 10001.
- Within 4-6 weeks after your CE enrollment form is received, you will be notified of your test results.
- If you pass, you will receive a certificate of earned contact hours and answer key. If you fail, you have the option of taking the test again at no additional cost.
- A passing score for this test is 11 correct answers.
- Need CE STAT? Visit www.nursingcenter.com for immediate results, other CE activities, and your personalized CE planner tool.
- No Internet access? Call 800-787-8985 for other rush service options.
- Questions? Contact Lippincott Williams & Wilkins: 800-787-8985

Registration Deadline: October 31, 2006

Provider Accreditation:
Lippincott Williams & Wilkins (LWW), the publisher of Orthopaedic Nursing, will award 3.0 contact hours for this continuing nursing education activity. LWW is accredited as a provider of continuing nursing education by the American Nurses Credentialing Center's Commission on Accreditation. This activity is also provider approved by the California Board of Registered Nursing. Provider Number CEP 11749 for 3.0 contact hours. LWW is an approved provider by the American Association of Critical-Care Nurses (AACN) 00112278, CERP Category B, Alabama #ABNP0114, Florida #FRN2454, and Iowa #75.
LWW home study activities are classified for Texas nursing continuing education requirements as Type 1. Your certificate is valid in all states.

This article has been approved by the Orthopaedic Nurses Certification Board for Category B credit toward recertification as an ONC.

Payment and Discounts:
- The registration fee for this test is $15.00 for NAON members and $30.00 for nonmembers.
- If you take two or more tests in any nursing journal published by LWW and send in your CE enrollment forms together, you may deduct $0.95 from the price of each test.
- We offer special discounts for as few as six tests and institutional bulk discounts for multiple tests. Call 800-787-8985 for more information.

CE TEST QUESTIONS

GENERAL PURPOSE: To present registered professional nurses with an overview of the physiology of normal sleep, followed by a detailed discussion about recognizing and treating insomnia.

LEARNING OBJECTIVES: After reading this article and taking this test, you will be able to:
1. Describe the characteristics of the sleep stages that comprise normal sleep.
2. Discuss the causes, contributing factors, and effects of insomnia.
3. Outline the various pharmacological options for treating insomnia.

1. Non-rapid eye movement sleep is characterized by
   a. decreased vascular tone.
   b. a slight increase in blood pressure.
   c. fluctuations in respiratory rate.
   d. highly active brain waves.

2. Alpha rapid-wave sleep is associated with which sleep stage?
   a. 1
   b. 2
   c. 3
   d. 4

3. About half of all sleep time is spent in which sleep stage?
   a. 1
   b. 2
   c. 3
   d. 4

4. A new REM sleep cycle begins about every
   a. 30 minutes.
   b. 60 minutes.
   c. 90 minutes.
   d. 120 minutes.

5. As the sleep cycles repeat and the body becomes more rested
   a. stage 2 disappears.
   b. stages 3 and 4 lengthen.
   c. REM sleep periods shorten.
   d. the body alternates between REM and stage 2.

6. Insomnia
   a. of the acute type is primarily caused by stress.
   b. is more common among men than among women.
   c. is considered chronic when it lasts more than three weeks.
   d. more often affects young adults than it does older adults.

7. Which of the following types of medication is known to cause or contribute to insomnia?
   a. calcium-channel blockers
   b. anticholinergics
   c. beta blockers
   d. salicylates

8. Which is the best predictor of cognitive effects of sleep deprivation?
   a. disturbed stage-1 sleep
   b. too little stage-2 sleep
   c. inadequate REM sleep
   d. loss of total sleep time

9. Alcohol
   a. acutely disrupts sleep
   b. increases REM sleep.
   c. prevents light sleep.
   d. promotes deep sleep.

10. Which of the following drugs is a benzodiazepine with a slow onset of action?
    a. zaleplon (Sonata)
    b. flurazepam (Dalmane)
    c. triazolam (Halcion)
    d. temazepam (Restoril)

11. The benzodiazepine-1 receptors are located in areas of the brain that are responsible for
    a. cognition.
    b. memory.
    c. sedation.
    d. psychomotor functioning.
12. The non-benzodiazepine hypnotics, such as zolpidem (Ambien), have which of the following properties?
   a. anticonvulsant
   b. rapid in onset
   c. memory-imparing
   d. muscle-relaxing

13. Priapism is a rare but serious adverse effect of which sedative used to treat insomnia?
   a. trazodone (Desyrel)
   b. doxepin (Sinequan)
   c. nortriptyline (Pamelor)
   d. amitriptyline (Elavil)

14. Which nutraceutical product used as a sleep aid acts specifically to relax the muscles of the gastrointestinal system?
   a. melatonin
   b. goji berry
   c. St. John’s wort
   d. valerian

15. Melatonin is FDA-approved for treating circadian rhythm sleep disorders
   a. that are causing chronic insomnia.
   b. even in pregnant and lactating women.
   c. in people with vision loss and no light perception.
   d. in combination with other mild sedatives.

---

CE Enrollment Form
Orthopaedic Nursing, September/October 2006: Managing Insomnia

A  Registration Information:
   Last name __________________________ First name __________________________ MI
   Address ____________________________
   City __________________ State __________ Zip __________
   Telephone _______ Fax _______ email _______
   Registration Deadline: October 31, 2008
   Contact Hours: 3.0
   Fee: NAON member: $15.00 □
   Nonmembers: $30.00 □

B  Test Answers: Darken one for your answer to each question.
   A  B  C  D
   1. □ □ □ □
   2. □ □ □ □
   3. □ □ □ □
   4. □ □ □ □
   5. □ □ □ □
   6. □ □ □ □
   7. □ □ □ □
   8. □ □ □ □
   9. □ □ □ □
   10. □ □ □ □
   11. □ □ □ □
   12. □ □ □ □
   13. □ □ □ □
   14. □ □ □ □
   15. □ □ □ □

C  Course Evaluation*
   1. Did this CE activity's learning objectives relate to its general purpose? □ Yes □ No
   2. Was the journal home study format an effective way to present the material? □ Yes □ No
   3. Was the content relevant to your nursing practice? □ Yes □ No
   4. How long did it take you to complete this CE activity? ___ hours ___ minutes
   5. Suggestion for future topics ________________________________

D  Two Easy Ways to Pay:
   □ Check or money order enclosed
      (Payable to Lippincott Williams & Wilkins)
   □ Charge my □ Mastercard □ Visa □ American Express
   Card # ____________________________ Exp. Date __________
   Signature ____________________________

*In accordance with the Iowa Board of Nursing, Administrative rules governing grievances, a copy of your evaluation of the CE offering may be submitted directly to the Iowa Board of Nursing.

Need CE STAT? Visit www.NursingCenter.com for immediate results, other CE activities, and your personalized CE planner tool!