Sleep Deprivation in the College Student

A Problem Worth Addressing

By

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# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abstract</td>
<td>1</td>
</tr>
<tr>
<td>Sleep Deprivation in the College Student: A Problem Worth Addressing</td>
<td>2</td>
</tr>
<tr>
<td>The Traditional College Student</td>
<td>3</td>
</tr>
<tr>
<td>Circadian and Ultradian Rhythms</td>
<td>4</td>
</tr>
<tr>
<td>How Much Sleep is needed for the Traditional College Student?</td>
<td>6</td>
</tr>
<tr>
<td>Assessing Sleep</td>
<td>8</td>
</tr>
<tr>
<td>Interventions for the Sleep Deprived Patient</td>
<td>10</td>
</tr>
<tr>
<td>Non-Pharmacological Interventions for Sleep Deprivation</td>
<td>10</td>
</tr>
<tr>
<td>Pharmacological Interventions for Sleep Deprivation</td>
<td>13</td>
</tr>
<tr>
<td>Conclusion</td>
<td>16</td>
</tr>
<tr>
<td>References</td>
<td>18</td>
</tr>
</tbody>
</table>
FIGURES

Figure 1 Sleep History ................................................................. 21
Figure 2 Sleep Diary ................................................................. 22
Figure 3 Sample Sleep Diary ......................................................... 23
Figure 4 Sleep Hygiene Measures .................................................. 24
Figure 5 Non-Prescription Pharmacologic Interventions .................... 25
Figure 6 Prescription Pharmacologic Interventions .......................... 26
Figure 7 Helpful Resources .......................................................... 27
Sleep Deprivation in the College Student:
A Problem Worth Addressing

Abstract

Sleep deprivation is a common problem in the young adult college student population. Sleep deprivation is linked to decreased physical health, mental health, and academic performance. Assessment of the young adult patient’s sleep habits is as important as assessing their diet and exercise habits. This article provides an overview of the physiology of sleep and the adverse effects of inadequate sleep. The article also outlines guidance for both assessment and treatment of sleep deprivation in the traditional college student patient. Sleep history and sleep diary templates are provided that may be used by the nurse practitioner to assess the college age student for sleep problems. Behavioral, cognitive, and pharmacologic therapies for the treatment of sleep deprivation are discussed along with some guidelines for their use. The nurse practitioner demonstrates the importance of maintaining adequate sleep to the young adult by assessing and addressing his or her sleep needs at each visit.
Sleep Deprivation in the College Student:  
A Problem Worth Addressing

Adequate sleep is a biological necessity, not a luxury, for the normal functioning of humans. Good mental and physical health depends on maintenance of adequate sleep. For most students, the college environment is full of new living and social experiences, new freedom from parental supervision, and new academic demands. Adequate sleep is often neglected. Researchers have noted a positive correlation between lack of sleep and decreased physical health, mental health, and academic performance. Lack of sleep has also been linked to an increase in psychosocial stress and the use of drugs and alcohol.¹

According to a poll conducted by the National Sleep Foundation (2000), seventy-five percent of young adults are never asked about their sleep habits by their primary care provider (PCP). Fifty-five percent of young adults ages 18-29 wake up "unrefreshed". Thirty-three percent of young adults report daytime sleepiness which is similar to the twenty-nine percent of shift workers reporting daytime sleepiness.² To provide comprehensive care for the young adult college student, the nurse practitioner (NP) must address these patients’ sleep needs as comprehensively as the NP addresses their dietary and exercise needs.³

This article describes the traditional college student and the problem of sleep deprivation within this population. It provides an overview of the physiology of sleep and the adverse effects of inadequate sleep. The article concludes with a set of
recommendations to help the NP better assess sleep deprivation in the college student and recommendations for devising appropriate treatment plans.

The Traditional College Student

The college student patient population falls into two groups: the traditional student and the non-traditional student. The traditional student is typically 17-25 years old and is in the late adolescent and early adulthood stages of development. The level of maturity in this group is variable. According to the text, *Pediatric Primary Care: A Handbook for Nurse Practitioners*, in middle adolescence, students hold the belief that their bodies are invulnerable and immortal. Risky behavior is common. In late adolescence, college students have matured and have acquired adult reasoning skills, including recognizing the consequences of their actions. These adult reasoning skills develop gradually and are not present in all college students all of the time. Many students continue to feel that their bodies are invincible. These students may participate in risky behavior and have difficulty realizing the consequences of their actions. The college student is often transitioning from living at home to living independently. This type of student generally is living away from home for the first time and lives on a college campus. The college student’s relationship with his or her parents ideally reflects this change and has become more adult – to – adult in nature. The student’s social and academic life revolves around campus life. Their social life is often full and many develop long term committed partnerships. The late adolescent or early adult student is developing his or her identity and exploring career options. Students may work on or off campus a few hours a week but generally they do not fully support themselves. In contrast, the non-traditional student is generally over 25 years of age.
Non-traditional students may be living independently, juggling academic demands with financial responsibilities arising from supporting themselves, including support of their families. Sleep deprivation is prevalent in both traditional and non-traditional student populations, but for different reasons. This article focuses on sleep deprivation in the traditional college student population.

Sleep deprivation and irregular sleeping habits have long been recognized as a phenomena prevalent among traditional college students. The college student’s life is full of new stimuli. Students live in close proximity in the dormitory. Noise from music, television, video games, and computers can often be heard twenty-four hours a day. Most dormitories enforce quiet times during the evening and nighttime hours. However, students are often distracted from going to bed at a reasonable hour by the activities of roommates or dorm-mates. Academic demands are often strenuous and grades need to be kept up for many reasons, including the need to get into graduate school or to maintain student loans. Students are subjected to new stimuli, including social demands, and the experimentation with alcohol, drugs, and sex. Many students find that they need to work in order to pay for college. Lack of sleep in this population is an increasing problem.

Circadian and Ultradian Rhythms

An understanding of the natural sleep cycle provides a basis for assessing and assisting the traditional college student who experiences inadequate sleep. Sleep involves two biological rhythms, the circadian and ultradian rhythms. The sleep-wake cycle, or circadian rhythm, is normally guided by the daily dark-light cycle in twenty-four hours. This biological clock determines “rhythmic changes in behavior and/or physiology.” Throughout the day, the body makes internal adaptations to meet the requirements of the
time of day. For example, the body slows down and prepares for rest as the day grows
darker. The circadian cycle can be influenced by internal factors such as hypersensitivity
to noise, a predisposition to worry, medical or psychiatric illnesses, medications, or
alcohol. The circadian cycles can also be influenced by other factors such as social
interactions, work schedules, activity, and exercise. Disruptions in this circadian rhythm
have been documented to be associated with health problems, particularly psychiatric
disorders such as depression. 7

Sleep also consists of two distinct cycles of non-rapid eye movement (non-REM)
and rapid eye movement (REM) sleep patterns which alternate in an ultradian rhythm
throughout the night. Sleep begins with non-REM sleep lasting between 70-90 minutes
followed by REM sleep lasting 10-30 minutes, the cycle then repeats itself. 8 The non-
REM phase of sleep can be broken down into four stages. Stage one is a light sleep stage
with a slowing of muscle and eye movement. In this stage the individual is easily
aroused. In stage two the brain waves slow down and are interspersed with occasional
rapid brain waves. Eye movements stop. Stage three is a deep sleep phase characterized
by Delta brain waves which are very slow brain waves. This phase also has occasional
short rapid brain wave activity. Stage four is also a deep sleep phase characterized by
predominantly Delta waves. There is no eye or muscle movement in this phase. The
REM phase is characterized by rapid, irregular, and shallow breathing, rapid eye
movements, still musculoskeletal muscles, and dreams. 3 An uninterrupted REM phase of
sleep is important in integrating learned material and in giving an individual a feeling of
being rested. 9
How Much Sleep is needed for the Traditional College Student?

Adults normally sleep an average of seven and a half hours per night. Teens need eight and a half to nine and a half hours of sleep per night. During adolescence there is a change in the circadian rhythm of childhood which is early to bed and early to rise. A sleep delay becomes the norm. The teenager finds it hard to go to sleep at his or her previous bedtime of 9-10 pm but feels more alert at night making it difficult to go to sleep before 11 pm.\textsuperscript{10} Awakening at the previous and earlier rising times creates a sleep debt or deprivation. Recent studies show that individuals who sleep six hours or fewer in twenty-four hours (short sleepers) as compared with those who sleep nine hours in twenty-four hours (long sleepers) have more neurosis, less creativity, report more hallucinations, more eating disorders, and exhibit lower academic performance.\textsuperscript{11}

College students are known for depriving themselves of sleep while juggling their studies and social demands leading to irregular sleep schedules and poor sleep quality. Many students deprive themselves of sleep during the week and sleep longer periods on weekends to make up for sleep deficits. This irregular sleep pattern leads to difficulty arising for early morning classes during the school week and increases sleepiness during the week. This behavior is known as the delayed sleep phase syndrome.\textsuperscript{12} Studies show that students who get less than 6 hours of sleep per night and have greater than a 2 hour difference between bedtime on the weekends and weekdays have a greater incidence of depression and problems in their academic performance. Most students are unaware of the effect the delayed sleep phase syndrome has on their mood or performance.\textsuperscript{1}
College students, many of whom are living away from home for the first time, cigarette use is common. Many engage in little or no exercise. These behaviors have all been associated with sleep disruption.\textsuperscript{5}

Alcohol consumption affects circadian rhythm.\textsuperscript{13} Alcohol intoxication prolongs the non-REM phase of sleep and decreases the REM phase. This disruption of the normal sleep cycle results in wakefulness during the night and a restless sleep.\textsuperscript{8} Studies show that cigarette smokers have more problems falling asleep, staying asleep and with daytime sleepiness. Exercising six or more hours before bedtime increases the quality and quantity of sleep and decreases daytime sleepiness. A lack of exercise contributes to a poor quality of sleep.\textsuperscript{5}

Researchers have identified a connection between a lack of sleep and an increased risk for and incidence of depression. Sleep deprivation, or an inability to satisfy the basic need for adequate sleep, can lead to a feeling of loss of control over one’s body. This deprivation can lead to a sense of helplessness and hopelessness which is present for many individuals who are clinically depressed. A student with a persistent irregular sleep schedule may be at risk for a downward spiral into depression. The longer this behavior exists, the more depressed the student may become.\textsuperscript{5,13}

Sleep deprivation and depression can create stress for the college student. The student often responds to stress by activating behavioral changes, such as self-medicating with alcohol or marijuana. These behavioral changes can further the sleep deprivation which may increase anxiety and deepen depression contributing to a negative spiral.
The body's response to stress with the subsequent release of cortisol can depress the immune system. This response makes the stressed person more vulnerable to illness. An increased susceptibility to upper respiratory infections, headaches, as well as sleep disturbances are seen in college students.\(^1\) \(^{14}\)

Students deprived of sleep have more problems learning concepts and concentrating on homework. Studies show an increase in the REM cycle of sleep after intensive learning. Students who get less than a full night's sleep experience a decrease in REM sleep time. These students do not integrate newly learned material as well and exhibit poorer performance on exams. Daytime sleepiness due to fatigue also adversely affects academic performance.\(^1\) \(^{15}\)

Symptoms of sleep deprivation can be confused with symptoms of attention deficit hyperactivity disorder (ADHD). Some patients are misdiagnosed with ADHD when the problem is sleep deprivation. Some of the overlapping symptoms are: inattention to tasks or details, failure to finish work, appearance of not listening when spoken to, easily distracted, forgetfulness, difficulty with impulse control, restlessness, "fidgety", talking excessively, and interrupting others in conversation.\(^1\) \(^{16}\)

**Assessing Sleep**

The approach to the college student with sleep deprivation should include a screening process to determine if the patient's sleep deprivation has a primary cause or if it is secondary to a medical, psychiatric, or neurologic condition. Common primary sleep disorders as defined by the Diagnostic and Statistical Manual of Mental Disorders, DSM-IV-TR, are divided into two categories, dyssomnias and parasomnias. Dyssomnias, problems with the amount, quality, or timing of sleep, include sleep apnea, insomnia,
narcolepsy, restless leg/periodic limb movement disorder (PLMD), and circadian rhythm sleep disorder. Parasomnias are unusual or abnormal behaviors that occur while sleeping such as sleepwalking, and nightmares. According to the DSM IV-TR sleep disorders by definition must last for at least one month and cause interference with daily functioning. Sleep deprivation may be part of the manifestation of psychiatric disorders such as depression, generalized anxiety disorder, post-traumatic stress disorder and ADHD. Sleep disturbances may also accompany medical conditions such as, diabetes, cancer, chronic pain, hormonal changes, or alcoholism. A medical history, including a sleep history, should be obtained from the patient to determine whether the patient’s sleep deprivation has a primary or secondary cause. Based on the recommendations from various practitioners, the questions in Figure 1 should be included in the sleep history (see Figure 1). The Sleep 50 questionnaire developed by Victor Spoormaker and colleagues of the Department of Clinical Psychology at Utrecht University, the Netherlands could also be used to assess whether a patient has a sleep disorder as defined by the DSM IV-TR criteria or whether the patient simply has a sleep complaint. The Sleep-50 questionnaire helps practitioners identify the most common sleep disorders defined by DSM IV-TR: sleep apnea, insomnia, narcolepsy, restless leg/PLMD, and circadian rhythm sleep disorder. Included in the questionnaire are questions about the parasomnias, nightmares and sleep walking. Questions about sleep quality, the number of hours of sleep per night, and the impact of sleep on daily
functioning are also part of the Sleep-50 questionnaire. With the use of these types of screening questions and questionnaires the nurse practitioner can determine whether the patient’s sleep deprivation is due to a primary or secondary cause.

Information gathered from a sleep diary helps the NP better understand the patient’s sleep quantity, quality, and the daily factors affecting the patient’s sleep. This information is also instrumental in helping the NP and patient devise an effective and appropriate treatment plan.

Figure 2 includes questions that might be included in a sleep diary as suggested by the National Jewish Medical and Research Center. These questions can be formatted into an easy-to-use chart that the patient completes daily for one to two weeks. The National Center on Sleep Disorders Research of the National Institutes for Health, National Heart, Lung, and Blood Institute in their pamphlet entitled “Insomnia Assessment and Management in Primary Care” provides a sleep diary template (Figure 3) that could be adapted to the college student patient. The current assessment tools available for assessing sleep deprivation are in a written form. Researchers and NPs might collaborate in the future to craft effective assessment tools that use more advanced technology.

Interventions for the Sleep Deprived Patient

Non-Pharmacological Interventions for Sleep Deprivation

Non-pharmacological treatments for sleep deprivation are successful in 60-80% of patients. Non-pharmacologic treatments include sleep hygiene, relaxation therapy, stimulus control therapy, sleep restriction therapy, and cognitive behavioral therapy.

* An English copy of the SLEEP-50 can be obtained from Victor I. Spoormaker, Department of Clinical Psychology, Utrecht University, P.O Box 80.140, 3508 TC Utrecht, The Netherlands v.i.spoormaker@fss.uu.nl.)
These treatments are helpful alone, in combination and when they are used with pharmacologic interventions.

Once a sleep deprivation problem is identified, information about sleep hygiene measures should be given to the patient. Sleep hygiene is defined as those behaviors that contribute to sleep. For many college students experiencing sleep deprivation, practicing good sleep hygiene can result in reducing or eliminating their sleep deprivation. Sleep hygiene practices are outlined in Figure 4.3,12,20,21,23

Relaxation therapies are also helpful at bedtime to quiet the mind and body in preparation for sleep. Patients can be taught progressive muscle relaxation exercises, breathing exercises, and biofeedback to reduce muscle tension. Visualization techniques and meditation also help to quiet the mind and redirect intrusive thoughts. These techniques should be used regularly as their effectiveness to help with sleeping problems increases with regular use.22 Relaxation therapies can be easily utilized by the sleep deprived college student to help induce sleep.

Stimulus control therapy is aimed at altering negative conditioning the patient may have developed around bedtime and the bedroom. The object is to have the patient associate lying in bed with rapidly going to sleep instead of lying awake. The patient should go to bed only when he or she is sleepy. If the patient is unable to get to sleep after 15-20 minutes, he or she should get up and leave the room, returning to the bed when sleepy. Patients should use the bedroom for sleeping and sex only, they should get up at the same time each morning no matter how much sleep they have had, and they should avoid napping. This type of therapy allows patients to learn to re-establish their
bedtimes and reset their bedroom environmental cues. These principles are also included in the sleep hygiene recommendations.

Sleep restriction therapy is another approach to helping patients associate bed with sleep instead of wakefulness. Using the patient’s sleep diary, the NP finds the average length of time the patient sleeps per night. The time spent in bed is then restricted to that number of hours. If the patient is sleeping an average of 5 hours per night, 3 hours less than their goal of 8 hours, the patient is instructed to stay in bed for 5 hours or for only the time they are actually asleep. The patient’s sleep efficiency is the ratio of the time asleep compared to the time in bed. The goal is to achieve sleep for 85% of the time that the patient is in bed. The patient’s accumulated sleep debt will gradually increase. Then adding 15 minutes to the length of time in bed each week the patient over time increases the number of hours asleep to meet his or her goal.

Cognitive-behavior therapy (CBT) has helped patients with sleep deprivation and insomnia. This form of therapy helps patients identify their own beliefs and attitudes about sleep and those sleep patterns that may be contributing to their sleep problems. Strategies can then be developed to deal with any dysfunctional attitudes and beliefs and emphasize functional attitudes and beliefs. This approach can result in long lasting benefits to patients.

Sleep hygiene, relaxation therapies, stimulus control therapy, sleep restriction therapy and CBT can be used alone, or in combination. Tools for dealing with sleep problems can give the patient the ability to control this important biological function. In addition to various therapies patients should be encouraged to keep a sleep diary so they can see more clearly their progress. The literature suggests that sleep hygiene measures
and stimulus control measures may be particularly helpful with college students. Together these two approaches give the patient specific guidelines for behaviors to engage in that aid sleep, behaviors to avoid that hinder sleep, and provide information on how to foster a positive association between being in bed and sleep. These measures are easy to implement by the college student in his or her dorm room.

**Pharmacologic Interventions for Sleep Deprivation**

The National Sleep Foundation (NSF) provides guidance as to when it is appropriate to prescribe sleeping medication for a patient with insomnia. This guidance can be used in determining when to prescribe medication for the college student with sleep deprivation. The NSF lists six conditions for when medication is appropriate for treating insomnia: 1) the insomnia’s cause has been identified and is most effectively treated with medication; 2) the current sleep problems are causing problems with the patient’s daily activities; 3) the patient has either unsuccessfully tried behavioral approaches or is unwilling to try them; 4) the patient is experiencing distress from the insomnia; 5) the patient’s insomnia is short-term; and 6) the patient’s insomnia is related to a biological or medical etiology or is related to a stressful event or an event that requires a change in circadian rhythm. NSF recommends starting patients with medications at the lowest effective dose and that medications be used in combination with good sleep hygiene practices and behavior therapies. Nightly medications should be used for only a short duration. If medication is used long term it should be used intermittently.

Non-prescription and herbal sleep aides, along with sleep hygiene measures or other non-pharmacologic treatments are a good place to start when helping the traditional college student regain his or her normal sleeping patterns (Figure 5). The non-
prescription sleep aids generally contain antihistamines, such as diphenhydramine, that have the secondary effect of causing drowsiness. The college student must be aware that taking antihistamines should not be mixed with alcohol or other drugs that may cause sedation. 25

The herbal and hormonal treatments of valerian tea, kava kava, and melatonin have been helpful to induce drowsiness. The herb, valerian root, steeped in water makes a valerian tea which taken before bedtime can induce sleep. Kava kava has been used alone or with valerian to help with stress related insomnia. Kava kava may cause liver damage especially if used in combination with other medications or substances that are hepatotoxic. It is advisable to monitor liver function while taking this medication. 26

Melatonin is a hormone. If melatonin is taken before bed it can also induce sleep. These products are categorized as herbal or nutritional and are not subject to the same stringent testing and governmental content restrictions as are drugs. The contents of these products may not be of standard quality or quantity and the long term effects of their use are not yet determined. 25 Many college students find herbal and nutritional products appealing and may therefore be interested in using these products along with sleep hygiene measures.

Most prescription medications for sleep are hypnotics. These medications are y-aminobutyric acid (GABA) receptor agonists which produce a calming effect, induce drowsiness, and help with sleep onset and sleep maintenance. The hypnotics fall into two categories, the benzodiazepines and non-benzodiazepines. The benzodiazepines, such as temazepam, and triazolam, have been used for many years as sleep aids. They are effective sleep aids but they are controlled substances and have the potential for
habituation and misuse. The non-benzodiazepine hypnotics, such as zolpidem, zaleplon, trazodone, and eszopiclone are closely related to the benzodiazepines. Trazadone is an anti-depressant and a legend drug while the other three have the potential for abuse and are schedule IV controlled substances. The benzodiazepine and non-benzodiazepine hypnotics have differing half-lives. Length of half-life is a consideration when determining which medication to prescribe. If the patient’s problem is with sleep onset then a short half-life medication is appropriate. If the problem is staying asleep, then a medication with a longer half-life is helpful. Minimizing next day drowsiness is also a consideration when prescribing medications with a longer half-life.

In July 2005 the FDA approved a melatonin receptor agonist, Ramelteon, which targets problems with sleep onset. Ramelteon is not a controlled medication, nor does it have abuse or tolerance potential. It has been helpful to induce sleep for patients with jet lag or who do shift work.

The following principles should be considered when prescribing any of these medications: (1) prescribe the lowest effective dose; (2) encourage intermittent use of the medication rather than nightly use; (3) alert patients to possible rebound insomnia with hypnotics especially when higher doses are used and the need to taper when stopping the medication; and (4) prescribe medications with a shorter half-life to decrease daytime sleepiness.

The college student may ask for sleep medication without trying sleep hygiene measures or other non-pharmacologic therapies in hopes of a quick fix to their sleep problem. It should be emphasized that these medications are most effective when used in combination with sleep hygiene measures and other non-pharmacologic treatments. If
the patient has waited to seek help and is feeling particularly desperate for sleep, initiating treatment with medication and non-pharmacologic treatments together may bring the best results. The non-benzodiazepines or ramelteon is a good choice for the college student to use for a short period of time, or to use episodically in situations when non-pharmacologic measures fail. Patients should be counseled on the dangers of drinking alcohol, taking recreational drugs, or other medications concurrently with these prescription medications.23,28

Figure 6 contains some of the commonly prescribed sleep medications, the onset of their action in minutes, their half life in the human body and a useful comment about each.

**Conclusion**

College age students are in a time of transition. Their lives are full of new social, emotional, and educational experiences. This group is notorious for sacrificing sleep to meet the other demands in their lives. Sleep deprivation is a common problem. Many in this age group continue to feel the immortality or invincibility of middle adolescence. They do not understand the impact sleep deprivation can have on them psychologically, physically, and educationally.

In understanding the prevalence of sleep deprivation in the college age patient, the NP should include a sleep assessment when caring for these patients. A sleep history included in the health history is an important tool for evaluating the patient’s sleep pattern. From the health and sleep history, the NP can determine whether the patient has a primary or secondary sleep problem and whether a referral to a sleep or other specialist is a necessary part of the treatment plan. If a referral is not necessary, the NP should ask
the patient to keep a sleep diary for 1-2 weeks and the NP should provide the patient with sleep hygiene information. A recommendation of other non-pharmacologic therapies should also be made at this time. Follow-up should include an appointment in two weeks to review the sleep diary and to see how the treatment plan is progressing. This follow-up is important in order to address changes needed in the treatment plan. The close supervision also helps with compliance to the treatment plan which ultimately enhances its success. Further follow-up care at one month may reveal the need for a change in the behavioral approach and the addition of a medication regimen. If medications are used the college student should be followed by the NP at 2-4 week intervals to assess the effectiveness of the medication, how often it is being used, and whether it is being taken with alcohol or recreational drugs. Including and emphasizing educational and behavioral therapies in treating sleep deprived college age patients will have life long implications in helping them to better understand how to take care of and meet their basic physiologic need for sleep.
References


17. First MB, eds. *DSM-IV-TR Diagnostic and Statistical of mental disorders* 7th ed. New Delhi, India: Jaypee Brothers Medical Publisher (LTD); 2005


25. National Sleep Foundation. Sleep aides: all you ever wanted to know...but were too tired to ask. Available at: http://www.sleepfoundation.org/sleeplibrary/index.php?secid=&id=65 Accessed August 29, 2006


Figure 1

Sleep History

1. Approximately how many hours do you sleep each night?

2. When do you go to sleep and wake up each day? Is this a consistent time each day? What is your normal evening routine?

3. Is your sleep restful?

4. Do you have daytime fatigue?

5. Do you use caffeine, alcohol, tobacco products, other stimulants or sedatives?

6. Do you take any medications including prescription medication, over the counter medications, or herbal remedies?

7. While sleeping do you snore, gasp for air, have excessive limb movements or other behaviors?

8. Do you have a family history of insomnia?

9. Do you have extraneous factors contributing to the sleep deprivation? For example are you experiencing or subjected to stressful life events, interpersonal relationship problems, interfering work schedules, or environmental light or noise?

If You Have Problems with Sleep

1. How long have you had problems with sleep?

2. Have you had this problem before?

3. Is your problem falling asleep, staying asleep, or waking very early in the morning?

4. What have you done to alleviate this problem in the past?
**Figure 2**

**Sleep Diary**

1. Time patient went to bed and the time the patient got up.
2. Length of time to fall asleep.
3. Numbers of times awakened during the night and for how long.
4. Number of hours of sleep per night.
5. Rating scale for the quality of sleep each night.
6. Sleep aids, alcohol, or caffeine taken before bed.
7. Number of naps taken during the day: what time, how many, and how long.
8. Other intervening variables that may have affected the patient’s sleep during this time.
### Sample Sleep Diary

<table>
<thead>
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<th>Date</th>
<th>Sun.</th>
<th>Mon</th>
<th>Tues.</th>
<th>Wed</th>
<th>Thurs</th>
<th>Fri.</th>
<th>Sat.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Complete each morning</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bed time for previous night</td>
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<td></td>
<td></td>
<td></td>
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<tr>
<td>Rise time</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Estimated time to fall asleep (previous night)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Estimated number of awakenings (previous night)</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td><strong>Complete each evening</strong></td>
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<td>Naps (time &amp; duration)</td>
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<td>Alcoholic drinks, number/ time</td>
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<tr>
<td>List stresses experienced today</td>
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<td></td>
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</tr>
<tr>
<td>Rate how you felt today</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1—very tired/sleepy</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2—somewhat tired/sleepy</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3—Fairly alert</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>4—Wide awake</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Irritability</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1= not at all/5=very</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Medications</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Figure 4

Sleep Hygiene Measures

1. Go to bed and get up at close to the same time every day. The variation between bedtime and arising time from day to day should be no greater than 2 hours.

2. Do not consume caffeine, alcohol, or nicotine within 4-6 hours of sleep. Do not consume heavy meals within 2 hours of going to bed.

3. Exercise at least 30 minutes daily 5-6 hours before bedtime. Do not exercise within 2 hours of going to bed.

4. Reserve the bed as a place for sleeping, resting, or sex. The bed is not a place to do work, read, or watch TV, unless these activities help you fall asleep.

5. Naps, if necessary, should be taken before mid-afternoon.

6. Stop working, studying, or other stimulating activities 2 hours before bedtime.

7. Establish a pre-bedtime ritual such as listening to quiet music, reading, a warm bath, yoga, or meditation. A small bedtime snack might include warm milk, herbal tea, or foods high in tryptophan such as bananas, turkey, or peanut butter.

8. Worries, or the “to do” list that may preoccupy the mind and prevent sleep, can be written out on a piece of paper to be dealt with in the morning.

9. The bedroom environment should be cool, dark, and quiet. The bedding should be comfortable.

10. Warm extremities can aid in sleep, so wearing socks to bed may make it easier to fall asleep.

11. If you are unable to fall asleep within 20 minutes, get up and read or do something that is not stimulating and engage in another quieting activity.

12. To help reset the sleep-wake cycle or circadian rhythm, make sure that the lights are dim 2-3 hours before bedtime. Upon awakening in the morning, spend 5-30 minutes in the sunlight or under a full spectrum light.
## Figure 5

### Non-Prescription Pharmacologic Interventions

**Common over-the-counter sleep aids:**

<table>
<thead>
<tr>
<th>Medication</th>
<th>Antihistamine</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Sominex</td>
<td>diphenhydramine</td>
</tr>
<tr>
<td>2. Nytol</td>
<td>diphenhydramine</td>
</tr>
<tr>
<td>3. Tylenol PM</td>
<td>diphenhydramine</td>
</tr>
<tr>
<td>4. Unisom</td>
<td>doxylamine</td>
</tr>
</tbody>
</table>

**Herbal or Nutritional**

1. Valerian tea
2. Kava kava
3. Melatonin
**Figure 6**

**Prescription Pharmacologic Interventions**

<table>
<thead>
<tr>
<th>Medication</th>
<th>Onset/min</th>
<th>Half Life/hours</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Benzodiazepines</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Temazepam</td>
<td>30</td>
<td>10-20</td>
<td>Good for frequent awakenings, less effective with sleep onset problems.</td>
</tr>
<tr>
<td>Triazolam</td>
<td>15-30</td>
<td>1.5-5</td>
<td>Good for sleep onset problems.</td>
</tr>
<tr>
<td><strong>Non-benzodiazepines</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Zolpidem</td>
<td>30</td>
<td>1.5-4.5</td>
<td>Low abuse potential.</td>
</tr>
<tr>
<td>Zaleplon</td>
<td>&lt;30</td>
<td>1</td>
<td>Good for sleep onset Problems.</td>
</tr>
<tr>
<td>Trazadone</td>
<td>30-60</td>
<td>5-9</td>
<td>Not FDA approved for sleep. Useful if insomnia is due to depression.</td>
</tr>
<tr>
<td>Eszopiclone</td>
<td>60</td>
<td>6</td>
<td>Low abuse potential. FDA approval for use up to 6 months duration.</td>
</tr>
<tr>
<td>Ramelton</td>
<td>20</td>
<td>2-5</td>
<td>Melatonin receptor agonist. Good for sleep onset. No next day residual effects.</td>
</tr>
</tbody>
</table>
Helpful Resources

1. American Academy of Sleep Medicine
   Resource for sleep information and referrals to sleep centers.
   http://www.aasmnet.org/PatientsPublic.aspx

2. National Center on Sleep Disorders, Research of the National Institute of Health. Provides information about sleep disorders and treatments both behavioral and pharmacologic.
   http://www.nhlbi.nih.gov/about/ncsdr/index.htm

3. National Sleep Foundation (NSF). Information on sleep and sleep disorders in easy to read brochures offered on their website.
   http://www.sleepfoundation.org/about.html

4. National Jewish Medical and Research Center. Provides patient information about sleep, sleep diaries, and sleep hygiene.
   http://www.njc.org

   http://www.sleepeducation.com