

Causes

Identification

Management

Consequences

MANAGEMENT

CONSEQUENCES

PROBLEM  
SLEEPINESS  
IN YOUR  
PATIENT



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*NATIONAL INSTITUTES  
OF HEALTH  
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## **Problem Sleepiness in Your Patient Working Group Members**

David Dinges, Ph.D. (Chair)  
Associate Professor of Psychology  
in Psychiatry  
Chief, Division of Sleep and  
Chronobiology  
Director, Unit for Experimental Psychiatry  
Department of Psychiatry  
University of Pennsylvania  
School of Medicine  
Philadelphia, PA

Eric Ball, M.D.  
Chairman, Department of Medicine  
Walla Walla Clinic  
Walla Walla, WA

Paul Fredrickson, M.D.  
Chairman, Psychiatry, Psychology,  
and Sleep Disorders Clinic  
Mayo Clinic  
Jacksonville, FL

Meir Kryger, M.D.  
Professor of Medicine  
St. Boniface Hospital  
Winnipeg, MB

Gary Richardson, M.D.  
Assistant Professor of Medicine  
Neurobiology Laboratory,  
Department of Medicine  
Miriam Hospital and Brown University  
School of Medicine  
Providence, RI

Stephen Sheldon, D.O.  
Assistant Professor of Pediatrics  
Northwestern University Medical School  
Director, Sleep Medicine Center  
Children's Memorial Hospital  
Chicago, IL

Virgil Wooten, M.D.  
Professor of Medicine and Psychiatry  
Sleep Disorders Center  
Eastern Virginia Medical School  
Norfolk, VA

Bill Zepf, M.D.  
Assistant Professor of Family Medicine  
Georgetown University School of Medicine  
Medical Director  
Fort Lincoln Family Medical Center  
Colmar Manor, MD

## **NHLBI Staff**

James Kiley, Ph.D.  
Director, National Center on Sleep  
Disorders Research  
National Heart, Lung, and Blood Institute  
National Institutes of Health  
Bethesda, MD

Susan Rogus, R.N., M.S.  
Coordinator, Sleep Education Activities  
National Heart, Lung, and Blood Institute  
National Institutes of Health  
Bethesda, MD

## **Support Staff**

Susan Shero, R.N., M.S.  
Program Manager  
R.O.W. Sciences, Inc.  
Rockville, MD

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## INTRODUCTION

If your patient is sleepy at inappropriate times, it is not a normal condition. Your patient may have what is called “problem sleepiness” and not realize it. Sleepy individuals exhibit impairment—ranging from poor functioning at home, school, or work to potentially life-threatening automobile crashes and industrial accidents. Performance deficits occur in all sleepy people, regardless of their education, occupation, or motivation to remain awake. Patients with problem sleepiness may complain of difficulty concentrating, fatigue, and emotional lability. Problem sleepiness occurs when the quantity of sleep is inadequate due to primary sleep disorders, other medical conditions, or lifestyle factors.<sup>1</sup> Initial assessment of problem sleepiness is facilitated by incorporating sleep-related questions into the history-taking process. The primary care physician has a central role in the detection and correction of problem sleepiness. The physician also has a major role in educating the patient about the signs and dangers of problem sleepiness; the underlying cause (e.g., the sleep/wake schedule or a sleep disorder) and its management; and the importance of obtaining adequate sleep for optimal functioning.

## CONSEQUENCES OF PROBLEM SLEEPINESS

### Automobile Crashes

The National Highway Traffic Safety Administration estimates that approximately 56,000 police-reported crashes per year result from drivers who were “asleep at the wheel.”<sup>2</sup> Individuals with untreated sleep disorders such as sleep apnea, narcolepsy, or insomnia have higher rates of automobile crashes than do other drivers.<sup>3,4</sup> In a survey of drivers in New York state, approximately 25 percent reported they had fallen asleep at the wheel at some time.<sup>5</sup> Fall-asleep crashes are especially common in young male drivers.<sup>6</sup>

### Adolescent Development and School Performance

In addition to placing young people at high risk for automobile crashes, problem sleepiness can impair learning, perceptual skills, and memory,<sup>7,8</sup> which may lead to poor school performance and grades. In adolescents and young adults, mood, attention, and behavior deteriorate when they obtain inadequate sleep.<sup>9</sup>

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***Sleepy individuals exhibit impairment—ranging from poor functioning at home, school, or work to potentially life-threatening automobile crashes and industrial accidents.***

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These changes may interfere with a teenager’s ability to cope with daily stressors.

### Work-Related Accidents

Sleepiness in the workplace contributes significantly to performance errors and increases the risk of accidents. Sleepiness has contributed to serious incidents in industrial operations, nuclear power plants, and all modes of transportation.<sup>10</sup>

## CAUSES OF PROBLEM SLEEPINESS

For all people, sleepiness is physiologically regulated by two primary processes:

- The body’s *circadian rhythm* causes an increase in sleepiness twice during a 24-hour period (in general, between midnight and 7 a.m. and in the midafternoon between 1 p.m. and 4 p.m.); and
- The *physiological need for sleep*, which is increased by sleep loss and sleep disruption.

The need for sleep and the circadian rhythm interact to determine the level of sleepiness and alertness.<sup>11</sup> People with disturbances of either of

these sleep-regulating mechanisms can exhibit problem sleepiness, with the most common causes being primary sleep disorders, other medical conditions that disrupt sleep, drugs, and lifestyle.

### Primary Sleep Disorders

**Obstructive Sleep Apnea**—Obstructive sleep apnea, a potentially life-threatening disorder, is produced by the narrowing or collapse of the upper airway during sleep that restricts or prevents breathing.<sup>12</sup> Repeated episodes of airway collapse throughout the night disrupt and fragment sleep and may produce hypoxemia and other cardiovascular stress. Sleep apnea has been suspected of contributing to myocardial ischemia and myocardial infarction in patients with coronary artery disease.<sup>13</sup> Sleep apnea is seen in approximately 4 percent of middle-age men and 2 percent of middle-age women.<sup>14</sup> The prevalence of sleep apnea is even higher among the elderly.<sup>15</sup> Symptoms of obstructive sleep apnea include chronic, loud snoring; gasping or choking episodes during sleep; excessive daytime sleepi-

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***The most common causes of problem sleepiness are primary sleep disorders, other medical conditions that disrupt sleep, drugs, and lifestyle.***

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ness; drowsy driving; automobile or work-related accidents; and personality changes or cognitive difficulties. Signs of possible obstructive sleep apnea are obesity, a thick neck,

systemic hypertension, and nasopharyngeal narrowing. The diagnosis of obstructive sleep apnea is confirmed by polysomnography. The severity of symptoms dictates the urgency for testing.

**Insomnia**—Patients with insomnia complain that sleep is difficult to initiate or maintain, or that it is neither refreshing nor restorative.<sup>4,16</sup> Insomnia is the most prevalent sleep-related complaint; approximately 30 percent of American adults report occasional insomnia,

and nearly 10 percent report chronic insomnia.<sup>4,17</sup> Women report insomnia more frequently than do men,<sup>4,18,19</sup> and insomnia complaints increase with age.<sup>19,20</sup> Some patients with insomnia have problem sleepiness.<sup>17,21</sup>

Insomnia is classified by the duration of symptoms. Acute insomnia is usually the result of a stressful life event or change in sleep environment or sleep schedule. Chronic insomnia may result from medical conditions, psychiatric disorders, or other causes.<sup>4</sup> Thus, a careful sleep history is required for an accurate diagnosis.

### Restless Legs Syndrome and Periodic Limb Movements in Sleep

—The symptoms of restless legs syndrome are commonly reported and include sensations of creeping, crawling, pulling, or tingling, which cause an irresistible urge to move the legs. These symptoms usually occur prior to sleep onset, making it difficult for the patient to fall asleep. Patients with restless legs syndrome often have coexisting periodic limb movements in sleep. The latter condition is characterized by episodes of repetitive, stereotyped limb (usually leg) movements occurring during sleep which may disturb the patient or bed partner.<sup>22</sup> The limb movements are often associated with partial or complete awakening, although patients are usually unaware of either the movements or the arousals. The prevalence of periodic limb movements in sleep increases with advancing age; as many as one-third of patients older than 60 may have this condition.<sup>23</sup>

Patients with restless legs syndrome and periodic limb movements in sleep may have problem sleepiness or nonrefreshing sleep caused by difficulty falling asleep or frequent arousals (partial awakenings that may not be remembered) during the night. The diagnosis of restless legs syndrome is based on history; there is no specific laboratory test. In contrast, periodic limb movements in sleep can be detected by polysomnography.

**Narcolepsy**—Narcolepsy is a chronic sleep disorder producing severe problem sleepiness. The primary symptoms of narcolepsy are excessive and overwhelming daytime sleepiness, even after adequate nocturnal sleep, and cataplexy, which refers to sudden episodes of muscle weakness triggered by emotional reactions (laughter, anger, or fear). Other classic symptoms of narcolepsy can include sleep paralysis (a temporary inability to talk or move upon falling asleep or awakening) and hypnagogic hallucinations (vivid, frightening, dreamlike experiences that occur while dozing or falling asleep).

Narcolepsy is often misdiagnosed. Symptoms are usually first evident during adolescence and young adulthood, commonly before the third decade of life. Narcolepsy can also occur in children. A definitive diagnosis of narcolepsy usually requires objective testing and evaluation by a sleep specialist.

#### **Other Medical Conditions That Disrupt Sleep**

Patients with medical conditions such as chronic bronchitis and asthma have more problems with initiating and maintaining sleep than healthy people do.<sup>24–26</sup> Congestive heart failure patients may have a higher prevalence of periodic limb movements in sleep, with associated arousals, and consequently suffer daytime sleepiness.<sup>27</sup> Patients with severe congestive heart failure who also have Cheyne-Stokes respirations suffer sleep fragmentation and nocturnal hypoxemia leading to problem sleepiness.<sup>28</sup> Chronically painful conditions such as rheumatoid arthritis, back pain, and sickle cell disease can also disrupt sleep and lead to problem sleepiness.<sup>29–31</sup>

#### **Effects of Drugs That Disrupt Sleep**

Prescription and over-the-counter drugs, as well as caffeine, alcohol, and nicotine, can have substantial effects on sleep and sleepiness. For example, *long-acting benzodiazepines* have residual sedative effects that contribute to daytime sleepiness;<sup>32</sup> *beta-blockers* can cause difficulty falling asleep and increase the number of awakenings;<sup>33</sup> and *theophylline* has been shown to disrupt sleep in some people even at low therapeutic doses.<sup>34</sup>

*Caffeine* can fragment sleep. The half-life of caffeine is between 3 and 7 hours, so even coffee consumed during the day may be an important cause of sleeplessness at night and therefore sleepiness the next day.<sup>35</sup> While *alcohol* shortens the time it takes to fall asleep and is often ingested by patients for this reason, it increases sleep disruption in the latter part of the night.<sup>33</sup> *Nicotine* can disrupt sleep and reduce total sleep time. Smokers report significantly more daytime sleepiness and minor accidents than do nonsmokers, especially in younger age groups.<sup>36</sup>

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#### **Inadequate Sleep Due to Lifestyle**

The need for sleep varies among individuals and, because of this, it is difficult to recommend a specific quantity of sleep for all persons. When adults are allowed to sleep without restriction, the average time slept is 8 to 8.5 hours.<sup>37,38</sup> Chronically obtaining too little sleep can lead to a cumulative sleep debt and problem sleepiness.<sup>39,40</sup> For some patients, problem sleepiness will be resolved when sleep duration is increased. If problem sleepiness is not resolved with added sleep, other causes need to be considered.



**Shift Workers**—Approximately 20 to 25 percent of the American work force is engaged in some form of shift work.<sup>41</sup> Most shift workers complain of difficulty falling or staying asleep or problem sleepiness<sup>42,43</sup> The sleepiness of shift workers is related to both insufficient sleep and the displaced timing of sleep and wakefulness.<sup>44</sup> The adverse effects of shift work differ among individuals and may vary with age, with younger

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***When adults are allowed to sleep without restriction, the average time slept is 8 to 8.5 hours. Adolescents need more sleep than adults do.***

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workers coping better than older ones.<sup>45</sup> Shift workers are at high risk for motor vehicle crashes; in one study, 20 percent had a traffic accident or a “near miss” in the preceding 12 months

because of sleepiness on the drive home from work.<sup>46</sup> Consequently, shift workers need to be advised about their increased risk for accidents. Because of this vulnerability, it is particularly important to assess the patient for inadequate sleep duration and coexisting sleep disorders, which will magnify the sleepiness caused by shift work.

**Adolescents**—A significant proportion of young people report symptoms of problem sleepiness that include difficulty with getting up for school, falling asleep in school, or struggling to stay awake while doing homework.<sup>47</sup> Such symptoms may be the result of inadequate sleep. Adolescents need more sleep than adults do, and for many this is at least 9 hours per night.<sup>48,49</sup> In addition, the circadian timing system may change during pubertal development, resulting in a tendency for adolescents to stay up later and sleep in later.<sup>50–53</sup>

## IDENTIFICATION OF THE PATIENT WITH PROBLEM SLEEPINESS

Patients may underestimate their degree of sleepiness. Questions regarding specific sleep/wake habits and activities, as well as input from family members, can reveal significant signs of problem sleepiness. To assess whether a patient is getting an adequate quantity of sleep, it is best to ask about bedtimes and rising times, because asking how long the patient sleeps is likely to yield an inaccurate estimate.

Comparison of sleep quantity on days off versus work days may be helpful. Patients who sleep several hours longer on days off (by sleeping in or napping) may not be getting enough sleep during the work week. They may describe feeling more alert on days off. Table 1 lists sample questions that can be incorporated into the history-taking process to obtain a sleep/wake profile. Accurate diagnosis of specific sleep disorders will require further exploration.

TABLE 1.

## Sleep/Wake Profile—Sample Questions

### Signs of Sleepiness

- Does the patient report dozing off or difficulty staying awake during routine tasks, especially while driving?
- Does the patient complain of difficulties or accidents at work/school/social activities/home due to poor attention span?
- Does the patient complain of sleepiness or nonrefreshing sleep, or is sleepiness frequently noted by others?
- Does the patient nap on most days or more often than once a day?

### Sleep Disorders

- Does it take the patient more than 30 minutes to fall asleep at night? Are there awakenings during the night? Unwanted early morning waking? [Relates to insomnia.]
- Does the bed partner report that the patient's legs or arms jerk during sleep? [Relates to periodic limb movements in sleep.]
- Does the patient report "creeping, crawling feelings" in the legs? [Relates to restless legs syndrome.]

- Does the patient snore loudly, gasp, choke, or stop breathing during sleep? [Relates to obstructive sleep apnea.]
- Does the patient (or family) describe cataplexy (sudden muscle weakness in response to emotional reactions), hypnagogic hallucinations (vivid, dreamlike experiences while falling asleep or dozing), or sleep paralysis (temporary inability to talk or move upon falling asleep or awakening)? [Relates to narcolepsy.]

### Quantity and Quality of Sleep

- Is the patient a shift worker? What are the work hours? Is the patient an adolescent?
- What are the bedtimes and rise times on weekdays and weekends?
- Does the patient use caffeine, tobacco, alcohol, or over-the-counter and prescription medications?
- Is the sleep environment conducive to sleep (relative to noise, interruptions, temperature, light)?
- Does the patient have a medical condition, chronic pain, or other cause of sleep difficulties?

## MANAGEMENT OF PROBLEM SLEEPINESS

Problem sleepiness can occur in any age group. It is not “normal.” Direct questions should be asked about inappropriate sleepiness. Family members also may be able to help clarify the situation. Patients need to be aware of the obligatory nature of sleep and its importance for optimal functioning. Because of inattention and

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inadvertent sleep onsets that can result from sleepiness, it is extremely important to educate the patient about the dangers of driving while sleepy.

Accurate identification of all causes of the individual’s problem sleepiness is crucial for effective

treatment. For example, an adolescent may have narcolepsy in addition to inadequate sleep, causing problem sleepiness. Similarly, a shift worker may have obstructive sleep apnea in addition to a sleep/wake schedule problem.

All patients, and especially young people, should be advised that preexisting sleepiness heightens the sedative effects of alcohol. Thus, a sleepy individual consuming a small amount of alcohol is much more susceptible to sedation, impaired performance, and automobile crashes than a well-rested one consuming the same amount of alcohol.<sup>54–56</sup>

Stimulants do not play a major role in the treatment of problem sleepiness (except for patients with narcolepsy), and they do not substitute for sleep. The regular use of stimulants by patients may be a clue to the existence of an underlying sleep disorder or problem sleepiness.

### Primary Sleep Disorders

Sleep disorders are chronic, necessitating long-term management and monitoring of affected patients. Primary care physicians play an important role in case-finding, as well as management of patients with sleep disorders.<sup>57</sup> Incorporating a sleep history into the general review of systems can be useful in the initial identification of these patients (see table 1). Patients with severe symptoms, such as falling asleep while driving, will generally require polysomnography for accurate diagnosis.

For patients with *obstructive sleep apnea*, treatment options range from behavioral therapies to oral/dental appliances to surgical interventions. Many patients are treated with nasal continuous positive airway pressure (CPAP), in which a mask is worn over the nose during sleep and pressure from an air blower forces air through the nasal passages, preventing airway collapse.

A broad treatment plan for *insomnia* may include behavioral therapies alone or a combination of behavioral and pharmacological treatments.<sup>58</sup> Short-term use of short-acting hypnotics has been shown to be effective in reducing problem sleepiness associated with acute insomnia. However, long-term use of hypnotics for insomnia remains controversial. Lower doses of short-acting agents should be prescribed for older patients.<sup>59</sup> In obstructive sleep apnea, hypnotics are counterproductive and worsen symptoms.

Pharmacotherapy for *restless legs syndrome* and *periodic limb movements in sleep* may include benzodiazepines, dopaminergic agents, or opioids. For mild cases of restless legs syndrome, patients may relieve symptoms by massaging the legs, exercising, and eliminating alcohol and caffeine intake.

Treatment of *narcolepsy* includes central nervous system stimulants for excessive daytime sleepiness, as well as anticholinergics and antidepressant agents for cataplexy. Scheduled naps are an important adjunct to drug therapy.

## CONCLUSION

Normal sleep is required for optimal functioning. Normal wakefulness should be effortless and free of unintended sleep episodes. Problem sleepiness is common and dangerous and has numerous causes. However, it is generally correctable. The primary care physician is in an ideal position to identify signs and symptoms of problem sleepiness and initiate appropriate care of the patient, including educating the patient about the significant dangers of functioning while impaired by sleepiness.

## WHERE TO GET MORE INFORMATION

- **National Center on Sleep Disorders Research (NCSDR).** The NCSDR supports research, scientist training, dissemination of health information, and other activities on sleep and sleep disorders. The NCSDR also coordinates sleep research activities with other Federal agencies and with public and non-profit organizations.

National Center on Sleep Disorders  
Research  
National Institutes of Health  
Two Rockledge Centre  
Suite 7024  
6701 Rockledge Drive, MSC 7920  
Bethesda, MD 20892-7920  
(301) 435-0199  
(301) 480-3451 (fax)

- **National Heart, Lung, and Blood Institute Information Center.** The Information Center acquires, analyzes, promotes, maintains, and disseminates programmatic and educational information related to sleep disorders and sleep-disordered breathing. Write for a list of available publications or to order additional copies of this brochure.

NHLBI Information Center  
P.O. Box 30105  
Bethesda, MD 20824-0105  
(301) 251-1222  
(301) 251-1223 (fax)  
<http://www.nhlbi.nih.gov/nhlbi/nhlbi.htm>

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