

# Detection of Insomnia in Primary Care

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Insomnia is a widespread condition with diverse presentations. Detection and diagnosis of insomnia present a particular challenge to the primary care physician. Patients seldom identify their sleep habits as the source of the complaints for which they are seeking treatment. Insomnia may be the result of many different medical or psychiatric illnesses or the side effects of medications or legal or illegal recreational drugs. Insomnia has a serious impact on daily activities and can cause serious or fatal injuries. With ever-increasing competition with sleep from 24-hour television broadcasts from hundreds of channels and the Internet, as well as more traditional distractions of late-night movies, clubs, and bars, we have become a society that sleeps 25% less than our ancestors did a century ago. We have no evidence, however, that we require less sleep than they did. This article presents strategies for detecting and diagnosing insomnia. *(J Clin Psychiatry 2001;62[suppl 10]:18-26)*

Mary came to my office for the first time for abdominal pain. After I ruled out gall bladder disease, she said, "And by the way, I can't sleep at night." She reported that she would toss and turn for seemingly hours, watching the clock, and that if she did drift off to sleep she would soon wake up and go through the same process again. Mary is 48, has been divorced for 5 years, and swears that her husband divorced her because he couldn't take her loud snoring any longer. She weighs 340 pounds and smokes a pack and a half of cigarettes per day. Mary is always sleepy during the day and often naps to try to catch up, but this strategy is of little value. Her son, aged 25 years, lives with her and has tape-recorded her gasping for air while asleep.

John never calls me except for real problems. He called me one day to tell me that he was feeling very upset and anxious. It was driving him crazy that, at the age of 68 years, he was selling his house in which he had lived for 28 years so that he and his wife could move in with their daughter and her family. He was losing weight, was often tearful, had no interest in his usual activities, and was very irritable. He complained of bellyache, dry mouth, dizziness, and blurry vision. He was also very tired and had no energy. When I asked him about his sleep, he said that he was having trouble getting to sleep, and that, if he did fall asleep, he would wake up a few hours later, unable to get

back to sleep again. He then asked me for something to help him sleep. He thought that it would help him a lot if he could get some sleep.

Regina came in complaining of tiredness. She had been tired for months and felt truly exhausted. She had already tried vitamins, minerals, herbal preparations, drinking coffee, and napping, but nothing seemed to help. Her tiredness was initially not so bad, but lately it was starting to interfere with her work as a part-time day care worker, and her husband and her sole teenaged child had noticed that she was more irritable and edgy. She reported no medical problems, took no prescription medications, and did not smoke or drink alcohol. When I asked her husband if he had noticed anything about her sleep, he remarked that she would move her legs every few minutes.

Janelle came to me on spring break. She said she was tired. Initially, the tiredness wasn't bothering her much, and she wasn't going to do anything about it. But recently her boyfriend had remarked that she didn't feel like doing anything anymore, and it caused some strain. She wanted me to give her something for energy, like vitamins or something similar. She seemed upset and edgy. I asked her about physical symptoms, but she reported none. When I asked about her sleep, she said that she had been having trouble falling asleep since last semester. Every night, she would toss and turn for 2 hours or longer. Her sleep problems seemed to begin in the summer, after a painful breakup with her previous boyfriend. Even though she was very happy with her current beau, her trouble falling asleep had continued.

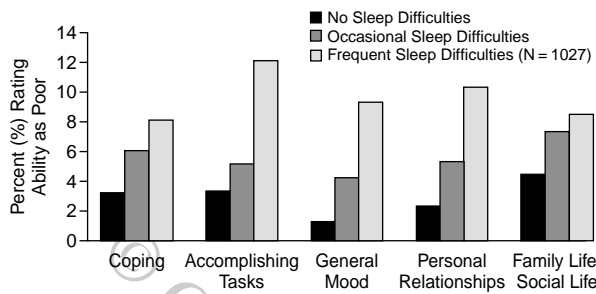
Marvine came in for a complete physical. She reported no major complaints. While taking her history, among other things, I asked her how she was sleeping, and she said, "Pretty good." I asked her about daytime sleepiness and energy level. She responded, "Oh, I'm always tired."

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Figure 1. Impact of Sleep Difficulties on Daily Functions in the General Population<sup>3</sup>



<sup>3</sup>Data from The Gallup Organization.<sup>2</sup>

She said she wanted to take naps but couldn't because of time problems. Also, even if she slept more on weekends, it did not substantially improve her energy level. She then also admitted that she was more irritable and was feeling more stressed out than previously. She carried a diagnosis of asthma and type 2 diabetes and temporomandibular joint dysfunction.

All these are typical cases of insomnia in primary care. This article will review the scope of the phenomenon, break the problem down into categories, and suggest how to detect insomnia in primary care.

Insomnia is defined by DSM-IV<sup>1</sup> as a complaint of difficulty initiating or maintaining sleep or sleep that is not restorative or refreshing. It involves daytime consequences, including tiredness, lack of energy, difficulty concentrating, and irritability. Many patients with sleep difficulties report impairment in daytime functioning. A poll<sup>2</sup> of the general population revealed that up to 12% of patients with frequent sleep difficulties (N = 1027) rate their daily function as poor because of sleep difficulties (Figure 1).

Insomnia is a common problem. In fact, it is the most common sleep disorder worldwide. National surveys of American adults revealed that 62% of those surveyed experienced a sleep problem a few nights a week or more during the past year<sup>3</sup> and 12% said they frequently had difficulty sleeping.<sup>2</sup>

Despite this prevalence and even though insomnia is a common complaint in the primary care setting, it is rarely the chief reason for the office visit with the primary care provider, as I indicated in the cases above. This prevalent problem has many consequences, however. Insomnia, causing unrecognized problem sleepiness and a significant level of impairment, causes problems from poor functioning at home, school, or work to life-threatening automobile and industrial accidents. Some famous examples of major mishaps directly attributed to judgment errors as a result of problem sleepiness are the Chernobyl disaster, the Three Mile Island incident, the Bhopal chemical disaster, the Exxon Valdez oil spill, and the Challenger space shuttle tragedy.

Moreover, this performance impairment has been likened to that caused by alcohol intoxication. Each year in this country, automobile accidents due to drivers falling asleep at the wheel number over 100,000, resulting in over 1500 deaths.<sup>4</sup> This death rate may soon surpass that caused by alcohol use in teenagers. According to the 2000 Omnibus Sleep in America Poll,<sup>3</sup> 51% of adults reported driving while drowsy within the past year, and 17% have dozed off while driving.

Because sleep disorders are so widespread in society, the primary care provider needs to have a high index of suspicion for insomnia and its consequences, not only when a patient presents with overt insomnia but also when patients present with symptoms like fatigue, daytime sleepiness, impairment of daytime function, and some others discussed later in this article. The primary care physician should try to identify sleep disorders in any patient—whether in for a regular office visit or for a complete physical—who shows a high risk of having insomnia.

Who is at higher risk for insomnia? Insomnia becomes more prevalent and more chronic with age—64% of adults aged 65 years and older regularly experience insomnia.<sup>3</sup> Many authors have attributed this higher rate of insomnia to comorbid illnesses.<sup>5-7</sup> Insomnia also has an increased prevalence in women compared with men.<sup>3</sup> Those in lower income and education levels suffer more from insomnia than those in higher levels.<sup>8</sup>

The primary care provider should consider the obese patient or the one who snores to be at risk for sleep disorders. During an examination, if the throat is disproportionately small or the tonsils are inordinately large, I ask if he or she snores. I am always surprised how many patients answer affirmatively, and how many cases of sleep apnea I catch that way.

## INSOMNIA CATEGORIZED

Insomnia can be acute or chronic. Acute insomnia, which generally lasts 2 weeks or less, is substantially more common than chronic, or recurrent, insomnia that occurs several times a year for at least 2 years and each time, lasts at least 3 days.<sup>1</sup> Acute insomnia is usually caused by identifiable factors like acute medical illnesses, changes in sleep environment, self-medication, jet lag, periodic work stress, marital strife, or concerns about health. On the other hand, chronic insomnia is more complex than acute, requiring a well-thought-out approach to pursuing its cause.

According to DSM-IV criteria, insomnia can be categorized as primary (Table 1) or secondary. Chronic insomnia is believed to be caused, in part, by a psychological conditioning process in which a medical or psychological stressor initially causes insomnia; later, even though the cause has gone away, the patient is conditioned, and the insomnia persists. The patient may fall asleep easily everywhere but the bedroom and remain wide awake in bed. In the case

**Table 1. DSM-IV Diagnostic Criteria for Primary Insomnia<sup>a</sup>**

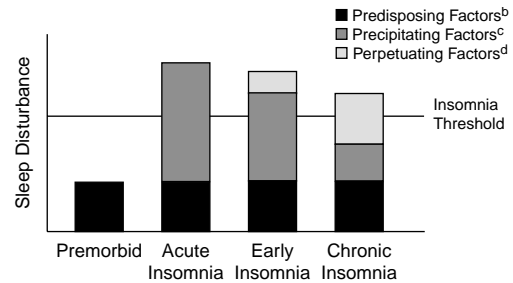
- A. The predominant complaint is difficulty initiating or maintaining sleep, or nonrestorative sleep, for at least 1 month.
- B. The sleep disturbance (or associated daytime fatigue) causes clinically significant distress or impairment in social, occupational, or other important areas of functioning.
- C. The sleep disturbance does not occur exclusively during the course of narcolepsy, breathing-related sleep disorder, circadian rhythm sleep disorder, or a parasomnia.
- D. The disturbance does not occur exclusively during the course of another mental disorder (e.g., major depressive disorder, generalized anxiety disorder, a delirium).
- E. The disturbance is not due to the direct physiological effects of a substance (e.g., a drug of abuse, a medication) or a general medical condition.

<sup>a</sup>Reprinted from the American Psychiatric Association,<sup>1</sup> with permission.

**Table 2. Common Causes of Insomnia**

Medical causes
Nonprescription drugs
Caffeine
“Diet pills” (e.g., those including pseudoephedrine, ephedrine, phenylpropanolamine)
Nicotine
Prescription drugs
β-Blockers
Theophylline
Albuterol
Quinidine
Stimulants: pemoline, dextroamphetamine, methylphenidate
Decongestants: pseudoephedrine, phenylephrine, phenylpropanolamine
Thyroid preparations
Corticosteroids
Selective serotonin reuptake inhibitors
Monoamine oxidase inhibitors
Methyldopa
Phenytoin
Chemotherapy
Benzodiazepines
Medical conditions
Primary sleep disorders (sleep apnea, periodic limb movement disorder, nocturnal myoclonus, restless leg syndrome, circadian rhythm sleep disorder, rapid eye movement behavior disorder)
Pain from any source or cause
Drug or alcohol intoxication or withdrawal
Thyrotoxicosis
Dyspnea from any cause
Neurologic disease (Parkinson’s, Alzheimer’s)
Acute and chronic medical illnesses (arthritis, cardiovascular disease, gastrointestinal disease, asthma, chronic obstructive pulmonary disease)
Psychological causes
Depression
Anxiety
Life stressors
Bedtime worrying
Conditioning (associating the bed with wakefulness)
Mania or hypomania
Environmental causes
Bedroom too hot or too cold
Noise
Eating, exercise, or caffeine or alcohol use before bedtime
Jet lag
Shift work
Daytime napping

**Figure 2. Factors Leading to Insomnia<sup>a</sup>**



<sup>a</sup>Reprinted from Spielman et al.,<sup>9</sup> with permission.

<sup>b</sup>Personality, sleep propensity, psychiatric illness.

<sup>c</sup>Acute stress (illness, drug, psychosocial).

<sup>d</sup>Behavioral, conditioning, arousal.

example cited earlier, Janelle had primary insomnia. She could not identify the cause of her problem, and it seemed that a life event that had eventually passed had caused the condition. This diagnosis was finalized only after a workup, which will be discussed later in this article.

Secondary insomnias are those caused by something identifiable (Table 2). The causes of secondary insomnia are very important to keep in mind; they can be medical and psychological. The medical causes include substance-induced insomnias and insomnias caused by medical conditions. The psychological causes include not only psychiatric illnesses, like depression, anxiety, and mania, but also environmental causes such as noise, jet lag, and shift work.

The prevalence of secondary insomnia is several times greater than that of primary insomnia, and it seems to be increasing. Secondary insomnia is often a diagnosis of exclusion. Of the secondary insomnias, the great majority are related to a mental disorder, with the psychiatric disorder as the predominant symptom: the presenting feature of these patients is depression, an anxiety disorder, or a mania, and the insomnia is a consequence but not the patient’s main problem. John, in my example above, fit into this category. Since psychiatric disorders are the most prevalent cause of insomnia, the primary care physician should feel well versed in identifying them.

Many secondary insomnias are caused by a mental disorder in which the insomnia is the predominating symptom. For example, a patient might complain of a sleep problem that the primary care physician soon identifies as due to depression, anxiety, or a life stressor. The remainder of the secondary insomnias are caused by general medical conditions or induced by substances; the former are more common than the latter.

There may sometimes be a relationship between acute and chronic insomnias (Figure 2). A precipitating factor due to a premorbid underlying problem can induce the symptom of acute insomnia. Then, perpetuating factors drive the patient from acute to chronic insomnia, even

though the precipitating factors wane. For example, a patient may have had an anxiety disorder for quite a while. Then a major life stressor, like a job change, causes acute insomnia, which then causes further problems and maybe some bad habits like drinking alcohol or poor sleep hygiene. Even though the patient gets used to the new job, the insomnia persists. Identifying the underlying premorbid anxiety disorder may be necessary for treatment to a full recovery.

### DETECTION AND DIAGNOSIS IN PRIMARY CARE

In our very busy schedules, when time is at a premium, we primary care physicians should have a concise approach to identifying patients with insomnia. A patient who complains of sleep trouble is probably the easiest case to identify, because we already know the patient has insomnia. To identify the specific kind of insomnia, ask how long it takes the patient to get to sleep, a period known as sleep latency. Sleep latency normally lasts up to 20 minutes; anything longer than a half an hour is abnormal. Patient questioning should include roughly what time the patient goes to bed, if bedtime varies, and what the range is. Next ask if the patient awakens throughout the night, and if so, how many times and how long it takes to fall back to sleep. Then ask what time the patient usually wakes up and how long the patient thinks he or she slept. Then ask whether the patient feels sleepy during the day, and when. Be sure to use words like "tired" and "fatigued" as well as "sleepy." Avoid asking, "How do you feel during the day?" If I am having trouble with a poor historian, I will ask, "Do you feel as if you could take a nap during the day?" or "Do you have sleep hunger during the day?" I am always surprised at how difficult it may be to exact information regarding daytime problem sleepiness from a patient. This questioning is most important in assessing the severity and urgency of the problem because of the consequences of daytime impairment discussed previously.

When the patient does admit to daytime sleepiness, ask about any impairment in daily function it has caused. Most important is driving. Ask if the patient feels sleepy driving or has almost fallen asleep or has fallen asleep while at a red light. I cannot emphasize these questions enough; if the patient is falling asleep while driving, then immediate intervention is imperative. For example, Eileen, a 60-year-old patient, reported months of daytime sleepiness so bad that she had fallen asleep at a red light and was startled awake by the horn from the car behind her. After more questioning, I was relatively sure that she had sleep apnea, so I started the usual medical workup and referred her to a sleep specialist immediately. I also emphasized that, until this problem was solved, she should not drive.

Ask what the patient's occupation is, and if insomnia has caused problems in it, and, of course, if the occupation is the cause of the insomnia. A month ago, when a patient came in complaining of insomnia, I was able to learn from

him that his performance at work had actually dropped to the point his supervisor noticed and remarked on it. The patient was a high-level computer problem solver at a large corporation and the entire company relied on him to solve its day-to-day computer problems. His work hours had been increasing and were up to 60 hours a week, including Saturdays, and the patient was having trouble relaxing when he got home at 7 p.m. Also, when he arrived at home after an hour-and-a-half commute, he was relying on up to 3 or 4 cans of beer to relax.

Next ask if the patient naps. If so, ask about frequency and duration of the naps and inquire whether naps reduce daytime sleepiness. Recently, during a complete physical examination, I was questioning a patient about sleep, and even though his nighttime sleep seemed fine, he admitted to midday sleepiness after lunch. So, he would go out to his car at his lunch break and take a half-hour nap, which restored him for the rest of the day. Such daytime sleepiness, treated with a nap, is seldom a problem. In contrast, Regina, a patient discussed earlier, said that a nap did not improve her daytime sleepiness.

### Physical Causes of Insomnia

The line of questioning should now become more specific as the type of insomnia becomes clearer, and the responses should also guide what to look for in the examination that ensues (see Table 2). If obstructive sleep apnea (OSA) is suspected, ask about snoring and waking up gasping. In taking the history of a patient with insomnia, it is very important eventually to question the bed partner about the patient's sleep. Sometimes this person will tell you that the patient actually doesn't breathe for what seems a long period of time. OSA is the most common of the medical causes of insomnia, estimated to occur in 4% of middle-aged men and about 2% of women in the same age group. Moreover, unrecognized OSA occurs in approximately 20% to 30% of hypertensive patients in this country.<sup>10</sup> It is associated with an increased prevalence of coronary artery disease, strokes, polycythemia, pulmonary hypertension, cor pulmonale, morning and nocturnal headaches, congestive heart failure, arrhythmias, nocturnal angina, and excess mortality. In the directed physical examination, obviously suspect OSA more strongly if the patient is obese, and also if he or she has a thick neck or a small throat, as mentioned earlier. In the area I practice, there is a particular predilection for this type of body habitus, and I see patients with OSA several times a week.

In restless leg syndrome, the patient has trouble falling asleep. Ask patients if their legs bother them at that time. Typically, the patient will respond that they "can't get their legs comfortable," that they feel as though their legs are achy, that they get "creepy-crawly" sensations in them, or that they pull or tingle. These sensations prevent the patient from falling asleep, and so they cause insomnia. The bed partner, if he or she is awake, will likely be annoyed by it.

In periodic limb movement, the patient repetitively and stereotypically moves a limb while asleep. Obviously this is unbeknownst to the patient, but the bed partner will be able to report this symptom. Periodic limb movement will either partially or completely awaken the patient, but he or she will be completely unaware of both the movements and the arousal. This condition often coexists with restless leg syndrome, and its prevalence increases with age, as does the prevalence of almost all sleep disorders. One study<sup>3</sup> cited as many as 27% of those older than 65 years suffering from it.

Circadian rhythm sleep disorder can be a cause of insomnia. Most senior citizens tend to go to sleep early in the evening and awaken correspondingly early in the morning. Early morning awakening is itself a common complaint in the elderly; it is normal and does not cause daytime sleepiness. However, some of the elderly find early awakening annoying and go to sleep later in the evening to compensate. The time of morning awakening, however, stays the same, so sleep deprivation and excessive daytime sleepiness ensue. Then naps become necessary, and soon there is complete disruption of the circadian rhythm. Sleep diaries are an especially valuable tool when either the patient cannot recall exactly all the details of sleep that you may need to know or you suspect that the patient may be distorting the reality of the sleep and wake times. Figure 3 shows a useful sleep diary handout for patients.

In rapid eye movement (REM) behavior disorder, most common in the elderly but fortunately rare, there is disinhibition of the process that normally prevents transmission of muscle activity during dreaming. Here, the patient may thrash about in bed, sometimes falling out of bed and suffering significant injury. I personally have never seen this disorder.

A consideration of insomnia in women only is menopause. Asking about this is important, as the transition into postmenopausal status is associated with deleterious changes in sleep. A recent study has shown that every “hot flush” promotes an arousal from sleep.<sup>12</sup> This same study concluded that insomnia may be a reason for instituting hormone replacement therapy.

A consideration of insomnia in men only is benign prostatic hypertrophy (BPH). Questioning how often the patient gets up in the middle of the night to urinate is quite important. Remember that these awakenings, as brief as they may be, can disrupt sleep architecture enough to cause daytime sleepiness. Insomnia is also associated with an increased likelihood of impotence.

Another medical condition to question for is pain from any source. Clinicians who practice inpatient medicine are well aware of how often we prescribe a sleep medication for those in the hospital. The primary care physician should be well aware that enough pain from any source can cause insomnia in the outpatient setting as well. One unfortunate patient of mine, who was recovering from alcoholism, was

Figure 3. Sample Sleep Diary for Use in Patients With Insomnia<sup>4</sup>

Sleep Diary					
Name:					
		Day 1	Day 2	Day 3	Day 4
Complete in Morning	Bedtime (date/time)				
	Rise time (date/time)				
	Estimated time to fall asleep				
	Estimated number of awakenings and total time awake				
	Estimated amount of sleep obtained				
Complete at Bedtime	Naps (number, time, and duration)				
	Alcoholic drinks (number and time)				
	List stresses of the day				
	Rate how you felt today 1 = Very tired/sleepy 2 = Somewhat tired/sleepy 3 = Fairly alert 4 = Wide awake				
	Irritability level 1 = None 2 = Some 3 = Moderate 4 = Fairly high 5 = High				
	Medications				

<sup>4</sup>Reprinted from Walsh et al.<sup>11</sup> The diary provides a night-to-night account of the patient’s sleep schedule and perception of sleep.

the victim of a car accident that caused a fractured femur. He was in pain when he returned home and didn’t get much sleep. It didn’t take him long to start taking higher doses of the oxycodone that his orthopedist had prescribed and taking more at sleep time. He had trouble getting his doctor to give him more pain pills, so he started drinking again to help with pain relief. When he came to me he was sleeping very erratically, both during the day and at night, was feeling terrible both physically and mentally, and was specifically suffering from severe depression. This fractured femur was an obvious pain source, but other pain sources may be more subtle, like arthritis or low-back pain.

Another obvious source of pain is headache. In one published article,<sup>13</sup> chronic daily headache with no identifiable source in adults, especially upon awakening, was attributed to a sleep disorder. One patient in my practice was

taking a butalbital preparation excessively and her workup was negative. Even after weaning her from butalbital, her headaches continued, so I referred her to a sleep laboratory. She was found to be oxygen desaturating while asleep, and she was eventually diagnosed with nocturnal asthma. Her headaches went away when she took a long-acting  $\beta$ -agonist at bedtime.

Be vigilant for dyspnea from any cause. In the history and physical, it is important to ascertain whether chronic obstructive pulmonary disease, asthma, or paroxysmal nocturnal dyspnea (PND) from congestive heart failure is present. Marvine, discussed earlier, came in for a physical and was found to have asthma.

It is important to consider the patient's medication history. Most prescription medications can cause insomnia in self-evident ways; the effects of others are more subtle. There are  $\beta$ -blockers; theophylline;  $\beta$ -agonists like albuterol; quinidine; stimulants like methylphenidate, dextroamphetamine, and pemoline; thyroid preparations; corticosteroids; monoamine oxidase inhibitors; methyl dopa; phenytoin; chemotherapeutic agents; and benzodiazepines. Benzodiazepines alter sleep architecture. Taken nightly for sleep induction, they can often cause daytime sleepiness. It can be difficult when a patient prescribed, for example, lorazepam for occasional anxiety has been taking it to get to sleep but is also sleepy during the day. All of the selective serotonin reuptake inhibitors (SSRIs), as well as some newer, similar agents like venlafaxine and bupropion, can initially cause insomnia. Such insomnia, however, can resolve in some cases with continued use.

Among nonprescription drugs, nicotine has similar effects. Asking whether the patient smokes (or chews) tobacco may not be adequate; also ask if he or she has increased consumption.

"Herbal" over-the-counter diet pills can contain not only many different botanical extracts but also active ingredients like theophylline and ephedrine. These ingredients can affect not only sleep but also cardiovascular and mental health.

Obviously the clinician should question the patient about alcohol consumption and especially whether consumption has increased. Certainly, many patients use alcohol to help them get to sleep, but alcohol actually causes more insomnia and daytime sleepiness by increasing sleep disruption in the latter part of the night. Moreover, since a preexisting sleepiness enhances the sedative effects of alcohol, a sleepy patient consuming a small amount of alcohol becomes more susceptible to performance impairment and driving accidents than a well-rested patient consuming the same amount. So be wary of the patient who has only a few beers at night to calm down or get to sleep, as this patient may be as impaired during the day as the one who drinks a lot more. Also remember that sleep disturbance can continue for a prolonged time, even after an alcoholic patient has stopped drinking.

Also ask about drug use if appropriate. Some baby boomers still use marijuana, and it is not unusual for these patients, if you have a good enough rapport with them, to confide in you that they use it, either to calm down now and then or on a daily basis. Marijuana is still a drug and causes significant disruption of sleep architecture.

### Psychological Causes of Insomnia

Insomnia can have psychological causes, and questions and examinations should be directed to detect them. Depression should be relatively simple to detect when the patient presents with that complaint. In depression and insomnia, however, the patient can come in with either insomnia or (much more commonly) depression as the predominant symptom. Between 50% and 95% of depressed patients have some form of sleep abnormality.<sup>14</sup> Depression has traditionally been associated with early-morning awakening and trouble falling back to sleep. In fact, the awakening can occur at any time in the evening and can occur more than once. When insomnia presents in these patients, it is disturbing, as it can reduce compliance with medications and be a significant hindrance to the course of psychotherapy.

Anxiety disorders are also relatively easy to diagnose. Just as in depression, insomnia runs rampant in anxiety disorders. Patients almost always have trouble falling asleep, typically for an hour or longer. I have found it quite rare for a patient suffering from a significant anxiety disorder to be sleeping well. It is crucial to identify these patients early and get them on the road to recovery swiftly, as they tend to find ultimately damaging ways to treat their sleep problem, like alcohol, other drugs, other people's medications, or their own medications (e.g., benzodiazepines) for the wrong reason.

New questions have recently been raised about the relationship between insomnia and psychiatric disorders. Until recently, we always thought that the psychiatric condition, like depression, would cause insomnia. However, 2 studies<sup>15,16</sup> recently have shown that long-term insomnia may predispose a patient to a mood disorder. So, not only does insomnia from any cause possibly push a patient into depression, but simply treating an insomnia regardless of cause could decrease the risk of a patient's developing depression.

Other psychological factors include life stressors, bedtime worrying, conditioning, environmental causes, noise, caffeine, alcohol, drugs, jet lag, shift work, exercising too late in the evening, and daytime napping (see Table 2). These factors are all volitional. Insomnia results from particular choices made by the individual. Many of us now live in a society of excess. Our population works longer hours, more days, and often works more than one job. Also, 20% of the American work force is engaged in some form of shift work.<sup>3</sup> And it has been demonstrated that shift workers sleep 8 hours less per week on average, so that in essence they sleep a full day less than nonshift workers. It

is no surprise, then, that most of these workers complain of difficulty falling or staying asleep or problem sleepiness. In one study,<sup>17</sup> 40% of shift workers reported falling asleep while driving during the past 12 months. These adverse effects differ among individuals and may vary with age, with younger workers coping better than older ones. The relationship between accidents and insomnia was noted previously. One study<sup>18</sup> found 20% of shift workers had had a traffic accident or a near miss in a 12-month period. Because of their vulnerability, it is especially important to identify these types of workers in our primary care practice, as any type of insomnia in these workers will be magnified by the shift work.

### Lifestyle

It is now the norm rather than the exception for mothers to work at least a part-time job, often with no help from extended family. As a society, we not only work hard but play hard, with night clubs and restaurants. We watch TV until early morning. And finally, with the advent of the Internet, we can have the whole world, and all the people in it, to interact with all through the night. We sleep 25% less than our ancestors did a century ago,<sup>19</sup> and there is nothing to indicate either that they required more sleep than we do or that we require less than they did. The amount of sleep we need is genetically determined and averages around 7.5 to 8 hours a night, with a range of 4 to 10 hours. Regularly shaving an hour or more from one night's sleep will soon lead to daytime consequences.

T. S. Wiley and Bent Formby, authors of *Lights Out: Sleep, Sugar, and Survival*,<sup>20</sup> believe that this chronic sleep deprivation leads to more than poor job performance, irritability, and accidents:

When we don't get enough sleep in sync with seasonal light exposure, we fundamentally alter a balance of nature that has been programmed into our physiology since Day One. This delicate biological rhythm rules the hormones and neurotransmitters that determine appetite, fertility, and mental and physical health. When we rely on artificial light to extend our day until 11 p.m., midnight, and beyond, we fool our bodies into living in a perpetual summer. Anticipating the scarce food supply and forced inactivity of winter, our bodies begin storing fat and slowing metabolism to sustain us through the months of hibernation and hunger that never arrive.

The authors theorize that this sleep deprivation and not simply overeating and lack of exercise is the cause of the currently rampant obesity and its resultant diabetes, hypertension, and coronary disease.

### Physical Examination

Information gathering by talking to the patient should be followed by examination and testing. In anyone suspected of an insomnia, certain parts of an examination should take place. This examination should take only 5 minutes.

1. Vital signs. Hypertension and respiratory diseases are associated with insomnia.
2. Head and neck. Examine for signs of possible hindrance to breathing, like retrognathia, tonsillar hypertrophy, and enlarged soft palate. Also note the size and consistency of the tongue, the size of the airway in the pharynx, the appearance of the soft palate, the uvula's size, shape, and position, and evidence of trauma. The nose should be examined for obstruction, either from a septal deviation, polyps, or engorgement of the turbinates as in chronic allergic rhinitis. Note if the nares collapse with inspiration, especially when the patient is supine.
3. The neck. Examine for thyroid enlargement or nodules.
4. Heart. Auscultate for signs of congestive heart failure.
5. Lung. Auscultate for degree of asthma and chronic obstructive pulmonary disease.
6. Extremities. Examine for signs of arthritis or any other causes of pain.
7. Neurologic system. Conduct a brief neurologic exam that includes the extraocular muscles and peripheral nerves.

### Laboratory Tests

After the examination is completed, a certain set of laboratory tests is usually warranted. In addition to a complete blood count and chemistry profile, thyroid-stimulating hormone, B<sub>12</sub>, and folate level tests are all appropriate. In some areas of this country, physicians will add a Lyme titer, but both the test and the possibility of this disease's causing insomnia are controversial. In some cases, a cardiogram is also a good idea. Medical causes of insomnia may also have their own set of necessary laboratory evaluations, like a chest x-ray if there is PND or arthritis panel if rheumatoid arthritis is suspected.

### The Sleep Specialist

By this time, with the history, physical, and maybe some laboratory testing, the primary care physician may have a good idea about the source of the patient's insomnia. Treatment can then be instituted accordingly. But when is referral to a sleep specialist, who can use polysomnography, indicated for insomnia?

1. First and foremost, if obstructive sleep apnea is suspected, referral is mandatory. However, as mentioned previously, severe daytime sleepiness warrants immediate referral.
2. Second, if any of the primary sleep disorders are suspected, polysomnography is required for diagnosis.
3. Third, refer to a sleep specialist when insomnia fails to respond to appropriate behavioral and/or pharma-

colytic treatments. Marvine, a patient discussed at the beginning of this article, came in for her annual physical and it was a challenge for me to elicit from her that she had problem sleepiness. I ended up referring her for a sleep study, and learned that she was oxygen desaturating from asthma rather than from obstructive sleep apnea, unbeknownst to her. The specialist informed me, and I prescribed a long-acting  $\beta$ -agonist metered dose inhaler (MDI); she improved greatly even after the first night.

## INSOMNIA IN TEENAGERS

Insomnia and narcolepsy can occur in teenagers. Obviously when a teenager has symptoms of tiredness, fatigue, problem sleepiness, or any symptom described in adults before, the same diagnostic approach holds. Getting a thorough understanding of the sleep/wake cycle is first and foremost, followed by the appropriate examination and testing. Please note here that unique to teenagers as far as examination and testing may be tests specific for mononucleosis. With teenagers, a sleep diary is most important, as there is often a dispute between parent and teenager as to bedtime, time spent tossing and turning, the number and length of naps, and when and for how long there is problem sleepiness.

### Delayed Sleep-Phase Syndrome

Sleep disorders to watch out for in this age group are delayed sleep-phase syndrome and narcolepsy. Delayed sleep-phase syndrome occurs in as many as 7% of teenagers.<sup>21</sup> In teenagers, circadian timing system changes are common, so there is a tendency for adolescents to stay up later and sleep later. This is why there is now a nationwide push for later high school starting times. But in delaying sleep-phase disorder, teenagers are wide awake late into the evening hours, sometimes until 3 or 4 a.m. When they manage to finally drag themselves out of bed and into school, their performance is obviously impaired, and not uncommonly they fall asleep in morning classes. This disorder can present with academic failure, truancy, and tardiness. Furthermore, sleep debt accumulates, so that on the weekends teenagers can sleep until late morning or even early afternoon, which further disturbs the circadian clock.

### Narcolepsy

Narcolepsy has a peak age at onset at 15 years old. It is usually hereditary, affecting nearly one in 2000 adults. Narcolepsy is often underrecognized and can cause the perception that the teenager is lazy, unmotivated, or learning disabled. Be on the lookout for this, noting the tetrad in this disease of sleep attacks (that is, an irresistible desire to fall asleep), sleep-onset paralysis, sleep-onset hallucinations, and cataplexy. If there is any reason to suspect narcolepsy, referral to a sleep specialist is in order. The spe-

cialist will probably do a Multiple Sleep Latency Test, which is basically a polysomnogram done during the day.

## CONCLUSION

To summarize, insomnia is a prevalent problem in this era; it has been touted as the disease of the 21st century. Its consequences can range from annoying to devastating. Its presentation can be quite subtle, and it can be, at times, challenging to elicit from patients who present to the primary care physician. However, with a high index of suspicion and an effective strategy, even the busy clinician can achieve early detection and expeditious treatment.

*Drug names:* albuterol (Ventolin), bupropion (Wellbutrin and others), dextroamphetamine (Dexedrine and others), lorazepam (Ativan and others), methyl dopa (Aldumet and others), methylphenidate (Ritalin, Concerta, and others), pemoline (Cylert), phenytoin (Dilantin and others), quinidine (CinQuin and others), venlafaxine (Effexor).

*Disclosure of off-label usage:* The author has determined that, to the best of his knowledge, no investigational information about pharmaceutical agents has been presented in this article that is outside U.S. Food and Drug Administration–approved labeling.

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