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**Chronic Insomnia  
and Pain**

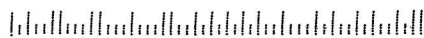
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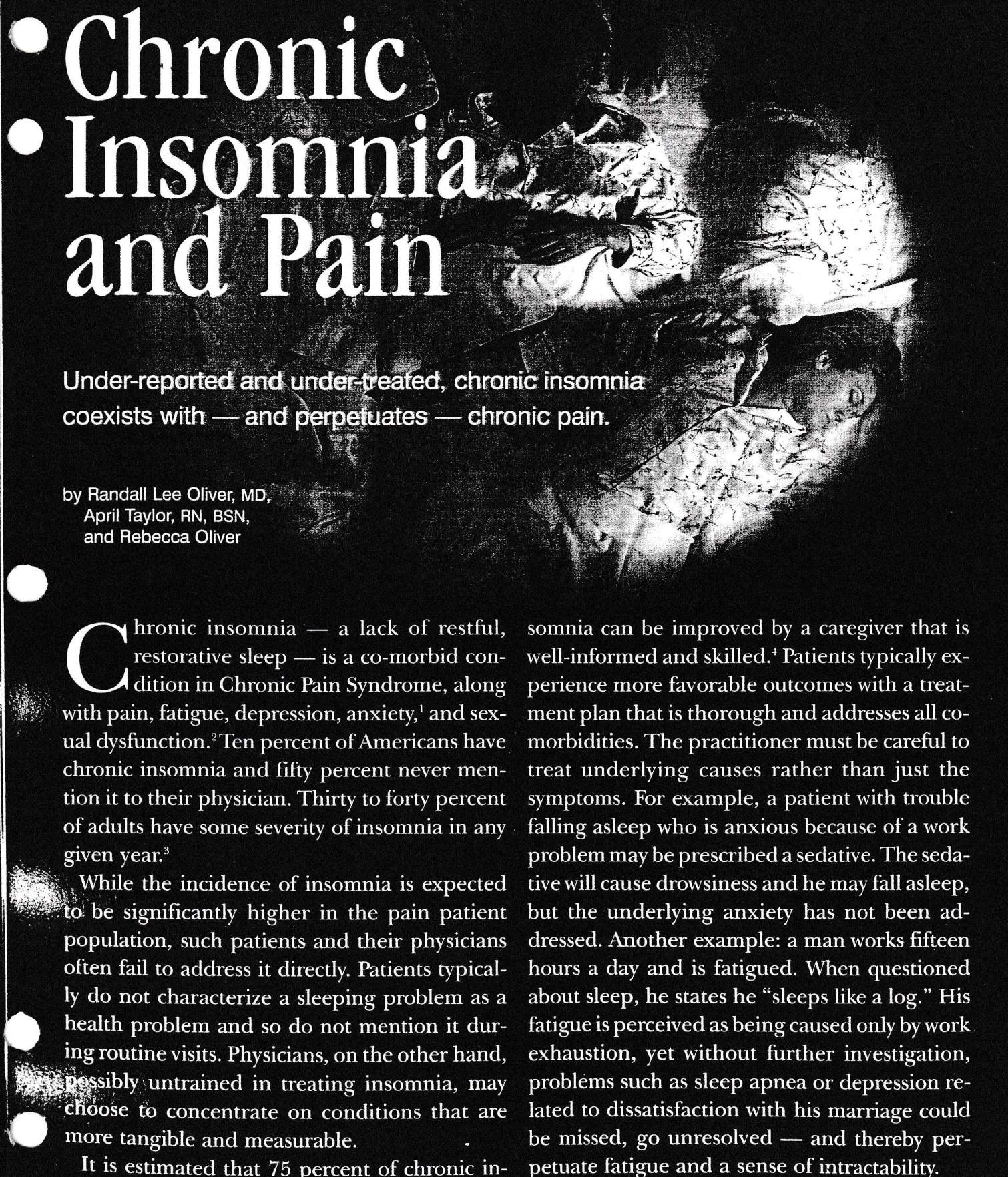
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# • Chronic • Insomnia and Pain



Under-reported and under-treated, chronic insomnia coexists with — and perpetuates — chronic pain.

by Randall Lee Oliver, MD,  
April Taylor, RN, BSN,  
and Rebecca Oliver

**C**hronic insomnia — a lack of restful, restorative sleep — is a co-morbid condition in Chronic Pain Syndrome, along with pain, fatigue, depression, anxiety,<sup>1</sup> and sexual dysfunction.<sup>2</sup> Ten percent of Americans have chronic insomnia and fifty percent never mention it to their physician. Thirty to forty percent of adults have some severity of insomnia in any given year.<sup>3</sup>

While the incidence of insomnia is expected to be significantly higher in the pain patient population, such patients and their physicians often fail to address it directly. Patients typically do not characterize a sleeping problem as a health problem and so do not mention it during routine visits. Physicians, on the other hand, possibly untrained in treating insomnia, may choose to concentrate on conditions that are more tangible and measurable.

It is estimated that 75 percent of chronic in-

somnia can be improved by a caregiver that is well-informed and skilled.<sup>4</sup> Patients typically experience more favorable outcomes with a treatment plan that is thorough and addresses all comorbidities. The practitioner must be careful to treat underlying causes rather than just the symptoms. For example, a patient with trouble falling asleep who is anxious because of a work problem may be prescribed a sedative. The sedative will cause drowsiness and he may fall asleep, but the underlying anxiety has not been addressed. Another example: a man works fifteen hours a day and is fatigued. When questioned about sleep, he states he “sleeps like a log.” His fatigue is perceived as being caused only by work exhaustion, yet without further investigation, problems such as sleep apnea or depression related to dissatisfaction with his marriage could be missed, go unresolved — and thereby perpetuate fatigue and a sense of intractability.



## Etiology

Insomnia is defined as difficulty falling asleep, maintaining sleep, waking up too early, or non-refreshing sleep.<sup>3</sup> Insomnia is a symptom — not a disease. Lack of sleep and the consequences are cumulative. Although chronic insomnia itself is not life threatening, it affects many aspects of normal functioning. The most prominent complaint with insomnia is fatigue. Lack of restful sleep is a major cause of fatigue. In addition to chronic pain, insomnia may also be caused by, or co-morbid with, a multitude of other non-pain related factors such as anxiety, panic, mania and depression,<sup>3,6</sup> smoking, Chronic Obstructive Pulmonary Disease (COPD), Congestive Heart Failure (CHF), Gastroesophageal reflux disease (GERD), restless leg syndrome, periodic limb movement, alcohol and drug abuse, lack of physical activity, physical exhaustion, chronic pain, connective tissue diseases, benign prostatic hyperplasia (BPH), enuresis, sleep apnea and hormone imbalance (hot flashes). Insomnia can be both a risk factor for depressive disorders and/or a symptom of

depression.<sup>6</sup> The practitioner needs to ascertain whether there are multiple factors causing the insomnia aside from the pain/insomnia connection in order to select a suitable treatment.

## Impediments to Restful Sleep

Chronic pain prevents the body from relaxing, which, in turn, blocks restful (delta wave) sleep. The lack of restful sleep amplifies a pain patient's perception of pain. It is often hard to distinguish whether chronic pain has led to chronic insomnia or the other way around. With chronic pain, a pain medication or pain control may be more important than a sleep aid. While simply treating the pain with opioids may help some patients sleep due to improving comfort, others may sleep worse since opioids generally interfere with sleep architecture.

Certain other medications taken for physical or psychological disorders can also affect the body's ability to achieve restful sleep. Such drugs may include beta-blockers, stimulating antidepressants, thyroid prescriptions, diuretics, cal-

cium channel blockers, decongestants, steroids, and antiparkinsonian agents.<sup>7</sup>

Some simple sleep agents, such as Elavil, and hypnotics, such as Dalmane, actually decrease delta wave sleep and cause less restful/restorative sleep, resulting in increased fatigue.

## Quality vs. Quantity of Sleep

The sleep process is classified into two phases — rapid eye movement (REM) and non-rapid eye movement (NREM). A typical night's sleep alternates between multiple periods of REM and NREM sleep. During REM sleep, the blood flow of the body is concentrated to the brain and away from the muscles. This stage is associated with restoration of mental functioning. Lack of REM results in poor memory, decreased concentration, agitation, anxiety, and slow reaction times.<sup>8</sup>

NREM sleep, also described as slow-wave sleep and delta wave sleep, is further separated into four stages. Stage one is a drowsy state. Stage two is a light sleep from which a person can be easily aroused. The third and fourth stages demonstrate delta

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Day	Time	Patient Score	
24-Jan-2002	15:00:00	04	
24-Jan-2002	16:00:00	04	
24-Jan-2002	17:00:00	09	
24-Jan-2002	18:00:00	04	
24-Jan-2002	19:00:00	09	
24-Jan-2002	20:00:00	06	
24-Jan-2002	20:59:00	09	Manual
24-Jan-2002	21:00:00	01	

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waves on an EEG. This is the deepest level of sleep and is associated with physical restoration. Blood flow of the body is concentrated to the muscles and away from the brain. Lack of slow-wave sleep results in increased pain and malaise.<sup>8</sup>

The duration of each stage of sleep varies somewhat from person to person and night to night. Medications can increase the duration of stages one and two and prevent delta waves and REM sleep. Also a body can become accustomed to a long latent phase due to excessive worrying or watching television in bed. This extends stage one and two. This may develop into a repetitive pattern. With behavior modification, especially sleep modulation, the structure of sleep can be altered.

The amount of sleep actually needed varies from person to person. It is a myth that a person needs eight hours of sleep per night. Some people will go to the office feeling they must have insomnia because they only sleep six hours per night, yet they feel rested during the day. As long as the patient is refreshed upon awakening and does not easily fatigue during the day, the number of hours does not matter; this pattern does not qualify as insomnia. "Not sleeping very much is not considered insomnia unless it impairs your daytime functioning or physical or mental well being."<sup>8</sup>

### Assessment

Finding the cause of insomnia makes treatment much easier than trying multiple medications and just waiting to see what works. A precise assessment often opens clues to the underlying cause. Physicians must move away from simply asking the patient: "Do you sleep ok?" First, patients want to please their caregiver, so they often answer with a simple "yes." Second, a person can perceive that they went to bed, fell right to sleep, and woke eight hours later, but not feel rested in the morning. Patients will even insist they do not have insomnia. They state they sleep too much because they are so tired. These patients are sleeping enough, but are not experiencing restorative sleep.

Figure 1 gives an example of a questionnaire that investigates all aspects of insomnia and gives an objective numeric score to the severity of insomnia. It is straightforward, quick and easy to fill out, and can be done while the patient waits for the doctor to come into the room. This questionnaire should be given to all pa-

tients as a screen for a sleep disturbance. Repeated application of the questionnaire on each subsequent visit can measure improvement.

### Treatment

Once the patterns of sleep are identified and the triggers for insomnia discovered, prioritize according to importance and tackle a couple at a time. Most people have had the insomnia for some time before coming to a doctor. Do not expect to cure it with one visit. The patient should also understand that more than one visit — and most likely, more than one treatment — will be required.

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Treatment should be focused both on medications and behavior modification. Medications are typically for short-term use to break insomniacs out of their cycle of fatigue and insomnia. Behavior modification has been proven to have longer lasting results alone than medications alone. The two therapies combined have been shown to have longer results than either alone.<sup>9,10</sup> In patients having Chronic Pain Syndrome, the pain is long-term and therefore they may need medication for insomnia long-term as well.

### Pharmacological Modalities

Medication includes hypnotics (both benzodiazepines and nonbenzodiazepines), antidepressants, over-the-counter medications, and herbal preparations. Benzo-

diazepines have been used for many years. They have been found to have the side effects of amnesia and daytime drowsiness.<sup>5</sup> In the elderly, benzodiazepines have been associated with ataxia and, therefore, an increase in falls. They have also been found to cause decrease in memory.<sup>11</sup>

The nonbenzodiazepines, Ambien and Sonata, are the only medications for sleep that have no affect on sleep stages. The nonbenzodiazepines also do not produce tolerance, rebound insomnia or alter psychomotor performance. There are no long-term studies for this class of medications. Nonbenzodiazepines are only approved for use for 30 days.<sup>12</sup> Due to the short half-life and lack of daytime sedation, Sonata can be used once insomnia occurs, as well as in prevention.<sup>13</sup>

Antidepressants, Elavil, Trazedone and Doxepin are commonly used for insomnia. The insomnia caused by SSRI antidepressants can be counteracted with Trazedone.<sup>10</sup> Also note that Elavil and Doxepin have been associated with daytime sedation.<sup>9</sup>

Although over-the-counter remedies have been proven to be less effective, and less safe than prescription sedatives, 40 percent of insomniacs self medicate with either an over-the-counter drug or alcohol.<sup>12</sup> Most OTC's contain an antihistamine. Antihistamines alter the structure of sleep by blocking delta wave sleep. They lose effectiveness over time and common side effects include dry mouth and hangover.

Herbal preparations include melatonin and valerian roots. Melatonin has only been found useful in sleep-wake cycle disorders. It has been proven to have poor hypnotic affect.<sup>12</sup> Recommended dose is 3mg at bedtime. Valerian root is a minor tranquilizer and hypnotic. Recommended dose is 400-900mg per night. The 900 mg produces better sleep but increases hangover. It is only proven to have small hypnotic affect.<sup>12</sup>

### Stimulus Control

Stimulus control emphasizes a sleep environment that avoids anything that can interrupt the progression of the sleep stages. The bed and bedroom should be used only for sleep. There should be no television watching, eating, reading, talking, phone conversations, or especially worrying or arguing in the bed and bedroom. One should leave the bedroom when one can not sleep, and return only



FIGURE 1.

## Sleep Questionnaire

Your doctor asks that you answer these twenty-five questions as honestly and sincerely as possible. This is a tool to help determine how well you sleep in order to help you have the best health possible. Thank you for your time.

Date \_\_\_\_\_

Name \_\_\_\_\_

1. How many hours do you sleep each night, on average?  
(0) 7 - 10 (1) 5 - 6 (2) 4 - 5  
(3) Less than 4 (4) More than 10
2. Where do you sleep?  
(0) Bed alone (1) Bed with someone (2) Couch  
(3) Chair (4) Floor
3. What time do you try to sleep each night?  
(0) Same time (4) Varies
4. What time do you get up each day?  
(0) Same time (4) Varies
5. How many hours do you spend awake in bed?  
(0) Less than one (1) One (2) Two (3) Three  
(4) More than three
6. Do you feel rested in a.m.?  
(0) Completely rested (1) Acceptable  
(2) Rested, but not adequate (3) Slightly rested  
(4) Not at all rested
7. How often do you have to take a sleeping medication to sleep?  
(0) Never (1) Seldom (2) Twice a week  
(3) Four times a week (4) Every night
8. How many times each night do you awaken?  
(0) None (1) One (2) Two (3) Three  
(4) More than three
9. Do you smoke?  
(0) No (4) Yes
10. How much alcohol do you drink?  
(0) Less than 1 drink per week (1) 1 - 2 per week  
(2) 2 - 3 per week (3) 1 per day  
(4) Greater than 1 per day
11. How many cups of caffeinated coffee/cola drinks per day?  
(0) None (1) One (2) Two (3) Three  
(4) More than three
- How often do sinus allergies bother you?  
(0) Never (1) Seldom (2) Twice a week  
(3) Four times a week (4) Every night
- How often do you have indigestion/acid reflux/heartburn?  
(0) Never (1) Seldom (2) Twice a week  
(3) Four times a week (4) Every night
14. How often do you have pain?  
(0) Never (1) Seldom (2) Few hours/week  
(3) Few hours everyday (4) Constant, every day
15. Are you depressed?  
(0) Never (1) Seldom (2) Occasionally  
(3) Currently, but tolerable (4) Currently, but severe
16. How often do you feel nervous or worry?  
(0) Never (1) Seldom (2) Few hours/week  
(3) Few hours a day (4) Constantly
17. When I wake up at night, I fall back asleep:  
(0) Quickly, easily (1) Within 10 minutes  
(2) 10 - 20 minutes (3) 30 minutes (4) Hours
18. How often do you wake to urinate in the night?  
(0) Never (1) One (2) Two to three  
(3) Three to four (4) More than four
19. Has anyone told you that you snore?  
(0) Never (2) Occasionally (4) Every night
20. Has anyone told you that you have moments when you sleep that you are not breathing?  
(0) No (4) Yes
21. Do you nap during the day?  
(0) Never (1) Occasional nap (2) Short nap daily  
(3) Multiple short naps daily  
(4) 60 minutes or more of napping daily
22. Do you dream?  
(0) Nightly, not disturbing dreams  
(1) Nightly, disturbing (2) All night  
(3) Occasionally (4) Never
23. How many hours do you work / labor each day?  
(0) 4 - 8 (1) 9 - 10 (2) 11 - 12 (3) 13 - 15  
(4) Less than 4 or greater than 15
24. How many hours of fun / recreation do you have per week?  
(0) A lot (1) Plenty (2) Few (3) Rare (4) None
25. How satisfied are you with your life?  
(0) Greatly satisfied (1) Satisfied  
(2) Somewhat Satisfied (3) Somewhat unsatisfied  
(4) Greatly unsatisfied

Total \_\_\_\_\_

Scale 0 - 25 Normal, 26 - 50 Mild Insomnia, 51 - 75 Moderate Insomnia, 76 - 100 Severe Insomnia

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when sleepy again.<sup>3</sup> The brain then associates the bedroom with only sleeping.

### Sleep Hygiene

Sleep hygiene refers to the avoidance of behaviors — both night and day — that keep a person from falling asleep and staying asleep. An example is avoidance of stimulants such as caffeine and smoking.<sup>1</sup> Nicotine is a powerful stimulant that increases heart rate, blood pressure, and brain wave activity.<sup>8</sup> Also alcohol is to be avoided since it leads to fragmented sleep. It is also important to follow the body's circadian rhythm<sup>9</sup> (the normal cycle of alert periods followed by drowsiness).

Anxiety, tension, and worrying are obstacles to a good night's sleep. Trying to sleep, or worrying about sleep, stimulates the mind and body. The body becomes classically conditioned to associate the bedroom and sleeping with worry.<sup>10</sup> Daytime problems can manifest themselves at night. Even when a person is not awake or aware of the disturbance, anxiety can prevent a person from going into delta wave sleep and REM sleep.

### Sleep Modulation

Generally, the longer a person stays in bed, the shallower their sleep will become.<sup>8</sup> The body starts to follow the pattern of slowly entering into each stage of sleep. The longer the latent phase becomes, the greater probability of sleep disruption. Sleep modulation is a technique of limiting total time in bed. This forces the body to go into delta wave sleep quicker. It takes two weeks to work and the person may feel worse before feeling better. Limit the time in bed to no more than five hours.<sup>8</sup> The person must avoid naps during the day and force wakefulness until the set bedtime hour. Within two weeks, the body falls into the rhythm of going to sleep quickly and for a limited time.

### Relaxation Techniques

Relaxation promotes blood flow to the muscles and the brain. It allows the brain to let go of stressful stimulus. It is important to be passive about relaxation — trying too hard is counter-productive. Techniques of meditation, imagery, abdominal breathing, biofeedback, and progressive relaxation can be taught to the patient.<sup>8</sup>

### Conclusion

Insomnia is a one of the co-morbid conditions in Chronic Pain Syndrome. The

signs and symptoms of insomnia, as well as the consequences, are varied and vague, leading many people to ignore their problem and physicians to avoid treatment. It is important to recognize that, for the pain patient, insomnia may be playing a large role in continued pain.

Screening and thorough assessment is the first step. Once the causes are identified, setting a goal with the patient is the next step. Pain patients may be confused at first when they are told that as part of their pain treatment, insomnia will be treated as well. It is important to elaborate: the goal is not the quantity of sleep, but rather restfulness and a subsequent improvement in daytime functioning and quality of life.

*Sleep hygiene refers  
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Treatment can be a long tedious process of trial and error. Treatment options should focus on decreasing the latent phase of sleep and increasing delta wave and REM sleep. The medications are most effective in the short-term, in combination with behavior therapy. The second-generation medications, Ambien and Sonata, do not alter the sleep structure and they do not cause the side effects associated with the other sedatives. Herbal preparations have little proven effect and the over-the-counter drugs should be avoided due to potential side effects. Antidepressants may be helpful for some patients. Behavior changes have a lasting effect and should be initiated at the same time as

medications. Involving the patient in the whole process and encouraging them to be open about the problem is an important part of the insomnia treatment. ■

*Randall L. Oliver MD, is Medical Director of the Oliver Headache & Pain Clinic, a regional pain center and President of the Indiana Pain Academy. He regularly lectures, writes, conducts research and presents seminars on multidisciplinary pain management. He can be contacted at oliverclinic@cs.com.*

*April Taylor, RN, is a research writer on multiple projects for Dr. Oliver. She is also a diabetes nurse educator for critical cardiac care patients at Methodist Hospital, Indianapolis, Indiana.*

*Becky Oliver is a recent graduate of McKendree College in Lebanon, IL, with a degree in English and Art. She has also been involved with researching and writing other articles on a variety of subjects and works at the Oliver Headache & Pain Clinic.*

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