CME ACTIVITY

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CME Objectives
After completing this CME activity, the physician should be able to:
- Explain the relationship between persistent insomnia and psychiatric illnesses
- Review data on the use of behavioral therapy as an adjustment to the pharmacologic treatment of insomnia
- Consider behavioral therapy as an adjunct to pharmacologic therapy for the treatment of patients with chronic insomnia

Statement of Need and Purpose
Psychiatrists and primary care physicians responding to articles in *The Journal of Clinical Psychiatry* and its related CME activities have indicated a need to know more about the use of applying behavioral therapy in daily practice. This CME activity is being provided to present information on the use of behavioral therapy in the treatment of sleep disorders. There are no prerequisites for participating in this CME activity.

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Drs. Dashevsky and Kramer have no significant commercial relationships to disclose relative to this presentation.

Discussion of Investigational Information
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Behavioral Treatment of Chronic Insomnia in Psychiatrically Ill Patients

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Background: Psychiatric patients often have residual intractable insomnia as a serious problem.

Method: Forty-eight psychiatrically ill patients (DSM-IV diagnoses) who had failed to respond to medicinal treatment for chronic insomnia were referred for and completed behavioral therapy as an adjunct to the pharmacologic treatment of their insomnia. The behavioral treatments included structured sleep hygiene, progressive muscle relaxation, stimulus control, and sleep restriction.

The treatment program was accomplished in 6 sessions over 2 months. Follow-up evaluations were completed at 2, 6, and 12 months from the beginning of the treatment program. The outcome of the treatment program was evaluated in terms of the change in (1) self-reported specific sleep parameters, (2) self-ratings of sleep-related daytime state, (3) self-rating of quality of sleep, (4) the use of sleep medication, and (5) the therapist's global rating of improvement.

Results: There was a statistically significant change from the baseline in all self-reported specific sleep parameters after 2 months that was sustained after 6 and 12 months. Sleep-related characteristics of daytime state showed statistically significant changes after 2 and 6 months that were maintained after 12 months. Sleep quality had a statistically significant change after 2 months, continued to improve statistically after 6 months, and was maximum after 12 months. Over half the patients (52.7%; 20 of 38) either reduced their sleep medication by half or stopped it completely. The therapist's global rating showed an improvement in 29.2% (N = 14) of patients after 2 months, 56.2% (N = 27) after 6 months, and 68.7% (N = 33) after 12 months.

Conclusion: The use of concomitant behavioral and pharmacologic treatment of chronic insomnia in psychiatrically ill patients results in improving sleep and sleep-related state and reduces the risk of return of insomnia for 10 months after finishing active treatment.

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Epidemiologic surveys have shown that chronic insomnia has a strong association with psychiatric disorders.[1–3] Patients with persistent insomnia have a significant increase in psychopathology.[4–10] Chronic insomnia, for example, is a good predictor for the development of major depression.[11–14] However, the clinical population of individuals with chronic insomnia with comorbid psychiatric illnesses seldom attracts the special attention of clinical sleep researchers or sleep physicians.[15,16]

Psychiatrically ill individuals with chronic insomnia are usually treated pharmacologically, but because there is an absence of controlled studies,[17,18] the efficacy of long-term pharmacologic treatment of chronic insomnia is not clear. In a case series report[19] of the effectiveness of long-term sleep medication in individuals with chronic insomnia (N = 150), the improvement rate was 61.3% at the time of last contact. The improvement rate in controlled behavioral treatment studies for primary insomnia is similar (49% to 74%).[20–23] However, the improvement is better sustained in those individuals with chronic insomnia treated with behavioral therapy.[6,9,24,25]

The use of behavioral therapy as an addition to pharmacologic treatment for individuals with chronic insomnia who are psychiatrically ill may be an optimal strategy. In one controlled study, the combination of triazolam and behavioral therapy was found to be more effective than triazolam alone for the treatment of a sleep-onset problem.[26]

Disturbances in daytime sleep-related aspects of insomnia, such as daytime mood disturbance, concern about sleep, fatigue, social discomfort, and feeling tired in the morning, are essential parts of the insomnia syndrome.[12,27,28] Treatment efforts for individuals with chronic insomnia need to focus on both the sleep disruption pat-

tern and the clinically important subjective sleep-related symptoms of daytime well-being.

The goal of this clinical study was to evaluate the result of behavioral treatment in psychiatrically ill chronic insomniacs that had failed to respond to medicinal treatment. Alterations in self-reported (1) specific sleep parameters, (2) daytime sleep-related characteristics, (3) quality of sleep, and (4) use of hypnotic medication and in (5) the therapist's global ratings of improvement are the parameters of concern.

METHOD

Subjects

The study population consisted of 67 patients who sought medical treatment for their chronic insomnia at the Sleep Disorders Center of Greater Cincinnati. They were self-referred or referred by their family physician or psychiatrist. Sleep, medical, and psychiatric histories were obtained from each patient. Criteria for inclusion in this group were (1) failure to respond to medicinal treatments for their insomnia and (2) being diagnosed with psychiatric illnesses according to DSM-IV. Nineteen (28.4%) of the patients discontinued the treatment program before completion and are reported elsewhere.[29]

Forty-eight chronic insomniac patients (36 women and 12 men) completed the treatment and follow-up program. Further demographic and clinical data are presented in Tables 1 and 2. Forty (83.3%) of the patients had Minnesota Multiphasic Personality Inventory (MMPI-2)[30] screening. Five (10.4%) of the patients had sleep onset insomnia, 14 (29.2%) had sleep maintenance insomnia, and 29 (60.4%) complained of combined sleep onset and maintenance insomnia.

Concurrent hypnotic medication was part of the treatment for 38 (79.2%) of the patients. The hypnotic medications included (1) tricyclic antidepressants (e.g., doxepin), (2) sedative benzodiazepines (e.g., clonazepam), and (3) others (e.g., trazodone). Only 2 patients (4.2%) were free of all medications.

Twenty-nine (60.4%) of the patients were taking psychotropic medication, which included tricyclic antidepressants, selective serotonin reuptake inhibitors, stimulants, and antipsychotics. Twenty-two patients (45.8%) were being treated for pain with analgesic medications.

Twenty-six patients with insomnia had comorbid depression. In 14 of these, the sleep problems were preceded by the onset of the depression, in 4 the onset of the depression was preceded by insomnia, and in 8 cases both insomnia and depression appeared together. For the 18 somatoform disorder patients, psychological disturbance was preceded by the onset of insomnia in 6 patients, whereas in 12 patients both complaints appeared together.

Table 1. Demographic, Clinical, and MMPI-2 Data and Self-Reported Baseline Sleep Parameters (N = 48)[a]

Item	Mean ± SD	Range
Demographic Data		
Age, y	47.3 ± 12.4	25–72
Education, y	13.6 ± 2.8	5–18
Clinical data		
Longevity of insomnia, y	11.0 ± 10.9	0.25–40
Family history of insomnia, %	42	…
Cornell Medical Index score	49 ± 27	10–127
Trouble sleeping, nights/wk	6.7 ± 0.7	4–7
MMPI-2 data (N = 40)		
Elevated MMPI-2 scale scores (> 65), no.	4.3 ± 2.7	0–9
Self-reported baseline sleep parameters		
Sleep onset latency, min	62.5 ± 56.7	3–205
Total sleep time, min	367.8 ± 106.3	177–531
Sleep efficiency, %	71.9 ± 16.6	31.6–94.7
Wake after sleep onset, min	61.9 ± 58.5	0–300
Awakenings, no.	1.9 ± 1.3	0–4.6

[a]Abbreviation: MMPI-2 = Minnesota Multiphasic Personality Inventory. Symbol: … = not applicable.

Table 2. Patient Psychiatric Diagnoses

	Patients Treated	
Diagnosis	N[a]	%
Depression	26 (5 M, 21 F)	54
Bipolar disorder	2 (2 F)	4
Schizophrenia	2 (2 F)	4
Somatoform disorder	18 (7 M, 11 F)	38

[a]Gender distribution in parentheses.

All patients signed informed consent forms approved by the Institutional Review Board of the Bethesda Hospital, Cincinnati, Ohio.

Procedure

The multicomponent behavioral treatment program was based on well-known techniques that we have used in our laboratory for many years.[31,32] These included the following:

1. Sleep hygiene instructions[33]: These are instructions for practices that promote restful sleep, such as a stable bedtime and wake-up time, limitation of caffeine and alcohol, and control of environmental factors.
2. Progressive muscle relaxation[34]: The main goal of the relaxation method is directed at reducing psychological and physiologic arousal.

3. Stimulus control procedures[35]: Some of the goals of stimulus control are reached by strengthening the bed as a cue (stimulus) for sleep.
4. Sleep restriction procedures[36]: These procedures consist of curtailing the amount of time spent in bed, bringing it initially as close as possible to the estimated sleep time and then gradually increasing it until an optimal sleep duration is achieved.

The behavioral treatment was individual, and the program was accomplished in 6 sessions over 2 months. All behavioral therapy was provided by the first author (B.D., a Ph.D. in psychology), who worked for 3 years under the supervision of the second author (M.K., an M.D., who is a psychiatrist and sleep medicine specialist). For an outline of the treatment and follow-up sessions, see the Appendix. On the average, the behavioral treatment program took 5 hours per patient. The first follow-up evaluation was done at the last treatment session. During the next 4 months, the patients received 3 or 4 follow-up sessions to encourage compliance with the treatment. At the end of this period, approximately 6 months from the beginning of the treatment process, the second follow-up evaluation was conducted. Daily sleep logs were collected at each session until the second follow-up, and daily for 2 weeks immediately preceding the final follow-up at 12 months. The data from these logs were averaged for 2 weeks prior to the evaluation point at 2 and 6 months to obtain the estimates used in analysis. At the 12-month follow-up (or in the letters, when patients were not available), we used the questionnaires (see Appendix 1).

The main outcome measures were (1) the self-reported specific sleep parameters of sleep onset latency, total sleep time, sleep efficiency (total sleep time divided by time in bed expressed as a percentage), wake time during the night after sleep onset, and number of awakenings; (2) subjective sleep-related characteristics of daytime state, such as feeling in the morning, concern about sleep problems, impact of sleep problem on mood and fatigue, and the social consequences of insomnia (rated on a 5-point severity scale from 0 ["no problem at all"] to 4 ["very much a problem"], adapted from Morin[28]); (3) sleep quality (rated on a 5-point scale, adapted from Morin[28]); (4) use of hypnotic medication; and (5) the therapist's global rating of the patient, which described improvement based on changes in both specific sleep characteristics and sleep-related characteristics of daytime state and which was defined according to the following guidelines:

1. Unchanged
2. Mild improvement: noticeable change in sleep-specific parameters with patient's subjective report of "some" or "mild" improvement in sleep-related clinical parameters (in this study, "clinical improvement" refers to improvement only in sleep-related disturbances)
3. Moderate improvement: statistically significant change in specific sleep parameters with patient's subjective report of "moderate" improvement in sleep-related clinical characteristics
4. Clinically important improvement: achievement of normal specific sleep parameters with patient's subjective report of considerable improvement in sleep-related clinical characteristics with or without sleep medications

Data Analysis

The response of the group of patients with chronic insomnia to the behavioral treatment was evaluated in terms of specific sleep parameters, sleep-related characteristics of daytime state, and quality of sleep at the follow-up evaluations and as a relative change in all those parameters, i.e., a parameter value at the time of follow-up evaluation minus its value at baseline divided by the value at baseline (expressed as a percentage), and also as the change in the therapist's global rating of the patient's improvement.

1. A 1-way repeated measures ANOVA using a Huynh-Feldt epsilon (ε) with the time of follow-up as the main factor was applied for the estimation of treatment efficacy for all reported specific sleep parameters. We applied a univariate (ANOVA) algorithm in SYSTAT by using a Huynh-Feldt epsilon to adjust the probability for the univariate tests. This approach controls Type 1 error. The reported sleep parameters were treated as numerical data. The univariate F test was used for examining the significance of differences in these parameters between baseline and each follow-up evaluation and between adjacent evaluations. An F test for a linear trend across the 4 evaluations was also applied.
2. Keeping in mind the ordinal nature of the sleep-related parameters, the Friedman test (a nonparametric analog of the classical repeated measures ANOVA for ranked data) was used to estimate the change in sleep-related self-rating characteristics of daytime state and sleep quality.

Table 3. Specific Sleep Parameters (Self-Reported) and Sleep-Related Parameters (Self-Ratings) at Baseline and at 2, 6, and 12 Months After the Beginning of Treatment[a]

Parameters	Baseline Mean	Baseline SD	After 2 Months Mean	After 2 Months SD	After 6 Months Mean	After 6 Months SD	After 12 Months Mean	After 12 Months SD	ANOVA F Test or Friedman Test Statistic
Specific sleep parameters									
Sleep onset latency, min	62.5	56.7	24.4***	24.8	22.4***	25.7	21.4***	17.4	26.0***
Total sleep time, min	367.8	106.3	403.8*	100.3	418.7*	104.0	421.9**	83.8	5.1**
Sleep efficiency,%	71.9	16.6	88.2***	9.2	90.6***	7.0	91.3***	6.7	61.9***
Wake time during the night after sleep, min	61.9	58.5	19.6***	41.5	13.9***	16.2	15.6***	29.7	17.9***
Number of awakenings	1.9	1.3	0.9***	0.9	1.1***	1.2	1.4*	1.3	9.95***
Sleep-related parameters									
Sleep concern	3.6	0.7	2.6***	1.2	2.2***	1.3	1.8***	1.5	53.1***
Mood disturbance	2.4	1.3	1.8*	1.2	1.5**	1.2	1.5***	1.1	20.39***
Fatigue	3.0	1.3	2.2**	1.2	2.0***	1.2	1.7***	1.2	21.97***
Social discomfort	2.3	1.5	1.8[b]	1.3	1.5**	1.3	1.3**	1.4	10.95*
Morning feeling	2.7	0.5	2.4**	0.6	2.2***	0.6	2.0***	0.6	27.9***
Sleep quality	2.5	0.7	2.1***	0.7	2.0***	0.7	1.7***	0.7	36.4***

[a]A 1-way repeated measures ANOVA (F test) was used for specific sleep parameters and the Friedman ANOVA (Friedman test statistic) was used for sleep-related parameters. Data comparisons were made between baseline data and data attained after 2, 6, and 12 months. Sleep-related parameters were rated on 5-point scales from 0 to 4 (see text).
[b]Nonsignificant.
*p < .05. ** p < .01. *** p < .001.

3. The change in the global improvement rate was examined with the McNemar test including Yates correction.
4. Spearman rank correlations between relative change in reported specific sleep parameters and all sleep-related self-ratings (including sleep quality) were calculated at each period of evaluation. For each period, the averaged value across all partial correlation coefficients was determined. Differences between averaged coefficients were tested with a *z* statistic for related samples.
5. The statistical package used was SYSTAT.[38]

RESULTS

All differences between the self-reported specific sleep parameters at the 2-, 6-, and 12-month evaluations and the same parameters at baseline were statistically significant (Table 3). The greatest positive change in these reported sleep parameters was seen at the 2-month evaluation. There is no statistically significant change in any specific sleep parameters between 2 and 12 months (the univariate F test for adjacent contrasts). However, the linear trends across the 4 evaluations for all specific sleep parameters were statistically significant: for sleep onset latency, $F = 28.08$, $p < .001$; for total sleep time, $F = 9.48$, $p < .01$; for sleep efficiency, $F = 93.58$, $p < .001$; for wake time during the night after sleep onset, $F = 24.02$, $p < .001$; and for number of awakenings, $F = 4.66$, $p < .05$.

The changes in all sleep-related parameters of daytime state were statistically significant at months 2, 6, and 12 compared with baseline. After 6 months compared with after 2 months, there were statistically significant changes for concern about sleep (Friedman test statistic = 5.36, $p < .05$), feeling tired in the morning (Friedman test statistic = 5.82, $p < .05$), and sleep quality (Friedman test statistic = 5.82, $p < .05$).

The mean correlation between the relative change in specific sleep parameters and sleep-related parameters was very low at the 2-month evaluation ($r = 0.11$, $p > .05$), increased after 6 months ($r = 0.24$, $p < .05$), with a significant difference between 6 and 2 months ($z = 3.15$, $p < .01$), and reached its maximum at 12 months ($r = 0.34$, $p = .001$), with a significant difference between the 12 and 6 months' correlations ($z = 2.86$, $p < .01$).

Combining the categories "moderate improvement" and "clinically important improvement" of the therapist's global improvement rating (Table 4), we observed improvement in 29.2% of patients after 2 months, 56.2% after 6 months, and 68.7% after 12 months. The change in the therapist's global rating between 2- and 12-month evaluations was substantially larger than that obtained between 2- and 6-month evaluations.

Table 4. Distribution of Global Improvement Rating at 2, 6, and 12 Months After the Beginning of Treatment[a]

	Unchanged		Mild Improvement		Moderate Improvement		Clinically Important Improvement	
Evaluation	N	%	N	%	N	%	N	%
2 Months	7	14.6	27	56.2	6	12.5	8	16.7
6 Months	7	14.6	14	29.2	13	27.0	14	29.2
12 Months	6	12.5	9	18.8	11	22.9	22	45.8

[a]McNemar test for changes in the global rating of improvement showed the followed results: between 2- and 6-month evaluations, $\chi^2 = 6.13$, p = .013; between 2- and 12-month evaluations, $\chi^2 = 13.51$, p = .000.

Of 38 patients treated with sleep medications, 8 (21.1%) withdrew from medication and 12 (31.6%) had their dosage decreased by half.

DISCUSSION

This clinical study of 48 psychiatrically ill patients with chronic insomnia treated with a behavioral approach in addition to hypnotic medication showed a substantial and sustained change in (1) reported sleep specific parameters, (2) sleep-related characteristics of daytime state such as feeling tired in the morning, mood disturbance, fatigue, social discomfort and sleep concern, (3) sleep quality, and (4) therapist's global rating of improvement. At the 12-month evaluation, we observed clinically important sleep improvement in 45.8% of the patients, which is similar to the statistically significant improvement in 49% of the patients at 1-year evaluation in the controlled studies of behavioral treatment of nonpsychiatrically ill patients with primary insomnia.[16]

It is important to note that 52.7% of the patients who had been taking hypnotics had stopped or decreased their dosage of hypnotic medication between 2 and 12 months from the beginning of the study. However, without the initial continued use of hypnotic medication, these patients would not have remained in the treatment program. An analysis of the group of patients who discontinued behavioral treatment[29] showed a tendency for dropout to occur in those who were initially without hypnotic medication.

Because of the small number of patients in different subgroups, we were unable to find any systematic differences in the effects of behavioral therapy combined with different types of hypnotic and/or antidepressant medications.

The rate of change in subjective specific sleep and subjective sleep-related parameters was different. Specific sleep parameters showed statistically significant and clinically meaningful changes after 2 months that were sustained after 6 and 12 months. But concern about sleep problems, feeling tired in the morning, and sleep quality, although statistically improved, still remained high after 2 months and improved further after 6 months.

A time-dependent increase in the correlations between the *relative* change in specific sleep and sleep-related parameters suggests a *dissociation* between the two. These correlations were low at the 2-month evaluation, increased at the time of the 6-month evaluation, and reached their maximum after 12 months. The patients reported at the 2-month evaluation that their specific sleep parameters were satisfactorily improved, but their daytime state remained at an unsatisfactory level (although statistically improved). Correction of the dissociation by behavioral treatment occurred sequentially across time, with sleep quality and other sleep-related parameters reaching their maximum improvement after 12 months (see Table 3).

In the treatment of patients with chronic insomnia, daytime sleep-related complaints should be attended to by clinicians as much as reported specific sleep parameters are. Continued monitoring and support after 2 months of active treatment may be necessary to achieve the maximum gain from behavioral treatment. The dissociation between self-reported specific sleep and sleep-related parameters should be added to the well-known dissociation between self-reported specific sleep complaints and objective polysomnographic sleep parameters in individuals with insomnia.[39,40]

The main goal of this study was to focus on the change during behavioral treatment process in patients with insomnia of the self-reported specific sleep and sleep-related characteristics. In clinical settings, focusing on the change in both the self-reported specific sleep and sleep-related parameters is perhaps the most practical way of monitoring the treatment process.

In summary, our data suggest that the use of concomitant behavioral and pharmacologic treatment of residual chronic insomnia in psychiatrically ill patients results in improving their self-reported sleep and subjective sleep-related state, maximizes the likelihood of success, and reduces the risk of relapse or recurrence of their insomnia in the first year. Either treatment alone is less likely to be successful in the treatment of insomnia.

Drug names: clonazepam (Klonopin), doxepin (Sinequan and others), trazodone (Desyrel and others), triazolam (Halcion).

Appendix 1. An Outline of the Behavioral Treatment Process and Follow-Up Sessions

Session 1.

(a) A psychologically oriented clinical interview (a medical history had been taken by the second author [M.K.] during the intake interview) using 3 questionnaires for self-rating by the patient of sleep-related problems: (1) concern about sleep problems; (2) impact of the sleep problem on mood and fatigue, and the social consequences of insomnia; and (3) daytime sleepiness.[28,37] Two weeks before the clinical interview, the patient kept a sleep log and rated morning feeling and sleep quality. These data were considered as baseline information.

(b) The first session of Progressive Muscle Relaxation (PMR; for references related to the techniques, see the Method) using the therapist's recorded tape. The tape consists of 10 muscle group relaxation exercises (about 17 minutes total) and 2 guided imagery examples (5 minutes each): an image of an escalator running downward and ocean beach images. The tape was given to each patient, with directions to use it twice a day (just before supper and in bed just before going to sleep).

Session 2.

(a) Structured sleep hygiene instructions with an emphasis on keeping a consistent waking time and on the importance of the circadian regulation of sleep (alteration of core body temperature and endogenous melatonin secretion in patients with chronic insomnia).

(b) Explanation of the Stimulus Control Procedure (SCP) and Sleep Restriction Procedure (SRP), and setting the first choice of an appropriate "sleep window" (sleep time) for each patient.

(c) Evaluation of progress in PMR.

Sessions 3 to 5.

(a) Because we had a group of psychiatrically ill patients, SCP and SRP were applied much more slowly than was recommended by the authors of these 2 methods in order to overcome the initial negative response to the explanation of these approaches. During sessions 3 to 5, individual appropriate adjustment of these procedures was provided.

(b) Evaluation of progress in PMR.

Session 6.

(a) The 2-month evaluation session.

(b) Outlining the long-term goal of the sleep regimen according to the SRP: increasing time in bed according to the improvement in sleep efficiency.

(c) Explanation of a tactic for slowly discontinuing use of the relaxation tape.

(d) Discussion with the clinically improved patients of the possibility of tapering from sleep medication. (All final decisions about tapering sleep medication were made by the second author [M.K.] in consultation with B.D. and after interviewing the patient.)

Three to 4 follow-up sessions occurred between 2 and 6 months of the program (i.e., between the first and second evaluations). Each of these sessions took about 30 minutes and focused on the following:

(a) Learning an abbreviated version of the relaxation method (PMR) without using the tape.

(b) Discussion of any difficulties in following the individual tapering program from sleep medications.

(c) Readjustment of the SRP for a patient if needed based on his or her log.

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DISCLOSURE OF OFF-LABEL USAGE

The authors of this article have determined that, to the best of their clinical estimation, no investigational or off-label information about pharmaceutical agents has been presented that is outside Food and Drug Administration–approved labeling.

Instructions

Psychiatrists may receive 1 hour of Category 1 credit toward the American Medical Association Physician's Recognition Award by reading the article starting on page 693 and correctly answering at least 70% of the questions in the posttest that follows.

1. Read each question carefully and circle the correct corresponding answer on the Registration form.
2. Type or print your full name, address, Social Security, phone, and fax numbers in the spaces provided.
3. Mail the Registration form along with a check, money order, or credit card payment in the amount of $10 to: Physicians Postgraduate Press, Office of CME, P.O. Box 752870, Memphis, TN 38175-2870.
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All replies and results are confidential. Answer sheets, once graded, will not be returned. Unanswered questions will be considered incorrect and so scored. Your exact score can be ascertained by comparing your answers with the correct answers to the posttest, which will be printed in the *Journal* issue after the submission deadline. The Physicians Postgraduate Press Office of Continuing Medical Education will keep only a record of participation, which indicates the completion of the activity and the designated number of Category 1 credit hours that have been awarded.

1. Epidemiologic surveys have shown that chronic insomnia has a strong association with:
a. Chronic fatigue syndrome
b. Psychiatric disorders
c. Migraine headache
d. Job absenteeism
e. Weight gain

2. Chronic insomnia is a good predicator for the development of which of the following psychiatric illnesses?
a. Schizophrenia
b. Bipolar disorder
c. Major depression
d. OCD
e. ADHD

3. Disturbances in daytime sleep-related aspects of insomnia are essential parts of the insomnia syndrome. Which of the following is *not* a disturbance in the daytime sleep-related aspects of insomnia?
a. Weight loss
b. Mood
c. Concern about sleep
d. Fatigue
e. Social discomfort

4. Which of the following techniques was *not* used in the multicomponent behavior treatment program described in this article?
a. Sleep hygiene instructions
b. Progressive muscle relaxation
c. Stimulus control procedures
d. Sleep restriction procedures
e. Nutritional counseling

5. The main outcome measures for the behavioral treatment program included all *but* which of the following observations?
a. Self-reported specific sleep parameters
b. Subjective sleep-related characteristics of daytime state
c. Effect on nutrition
d. Sleep quality
e. The therapist's global rating of patients

6. Of the 38 patients treated with sleep medication, how many were able to withdraw from the medications as a result of the behavioral treatment program?
a. 8 (21.1%)
b. 12 (31.6%)
c. 18 (47.4%)
d. 27 (71.0%)
e. 29 (76.3%)

7. Of the 38 patients treated with sleep medication, how many were able to have their dosages decreased by half?
a. 8 (21.1%)
b. 12 (31.6%)
c. 18 (47.4%)
d. 27 (71.0%)
e. 29 (76.3%)

8. In this clinical study of 48 psychiatrically ill patients with chronic insomnia, what percentage of the patients showed clinically important sleep improvement at the 12-month evaluation?
a. 18.2%
b. 21.1%
c. 31.6%
d. 45.8%
e. 52.7%

Answers to the June 1998 CME posttest

1. b 2. a 3. b 4. d 5. e 6. a 7. e

Circle the one correct answer for each question.

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8.	a	b	c	d	e

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1. Was the educational content relevant to the stated educational objectives? ❑ Yes ❑ No
2. Did this activity provide information that is useful in your clinical practice? ❑ Yes ❑ No
3. Was the format of this activity appropriate for the content being presented? ❑ Yes ❑ No
4. Did the method of presentation hold your interest and make the material easy to understand? ❑ Yes ❑ No
5. Achievement of educational objectives:
   A. Enabled me to explain the relationship between persistent insomnia and psychiatric illnesses. ❑ Yes ❑ No
   B. Enabled me to review data on the use of behavioral therapy as an adjustment to the pharmacologic treatment of insomnia. ❑ Yes ❑ No
   C. Enabled me to consider behavioral therapy as an adjunct to pharmacologic therapy for the treatment of patients with chronic insomnia. ❑ Yes ❑ No
6. Did this CME activity provide a balanced, scientifically rigorous presentation of therapeutic options related to the topic, without commercial bias? ❑ Yes ❑ No
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