

# Integration of Behavioral and Relaxation Approaches into the Treatment of Chronic Pain and Insomnia

National Institutes of Health  
Technology Assessment Conference Statement  
October 16–18, 1995

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# Integration of Behavioral and Relaxation Approaches into the Treatment of Chronic Pain and Insomnia

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## *Abstract*

**Objective.** To provide physicians with a responsible assessment of the integration of behavioral and relaxation approaches into the treatment of chronic pain and insomnia.

**Participants.** A non-Federal, nonadvocate, 12-member panel representing the fields of family medicine, social medicine, psychiatry, psychology, public health, nursing, and epidemiology. In addition, 23 experts in behavioral medicine, pain medicine, sleep medicine, psychiatry, nursing, psychology, neurology, and behavioral and neurosciences presented data to the panel and a conference audience of 528.

**Evidence.** The literature was searched through Medline and an extensive bibliography of references was provided to the panel and the conference audience. Experts prepared abstracts with relevant citations from the literature. Scientific evidence was given precedence over clinical anecdotal experience.

**Assessment Process.** The panel, answering predefined questions, developed their conclusions based on the scientific evidence presented in open forum and the scientific literature. The panel composed a draft statement that was read in its entirety and circulated to the experts and the audience for comment. Thereafter, the panel resolved conflicting recommendations and released a revised statement at the end of the conference. The panel finalized the revisions within a few weeks after the conference.

**Conclusions.** A number of well-defined behavioral and relaxation interventions now exist and are effective in the treatment of chronic pain and insomnia. The panel found strong evidence for the use of relaxation techniques in reducing chronic pain in a variety of medical conditions as well as strong evidence for the use of hypnosis in alleviating pain associated with cancer. The evidence was moderate for the effectiveness of cognitive-behavioral techniques and biofeedback in relieving chronic pain. Regarding insomnia, behavioral techniques, particularly relaxation and biofeedback, produce improvements in some aspects of sleep, but it is questionable whether the magnitude of the improvement in sleep onset and total sleep time is clinically significant.

## *Introduction*

Chronic pain and insomnia afflict millions of Americans. Despite the acknowledged importance of psychosocial and behavioral factors in these disorders, treatment strategies have tended to focus on biomedical interventions such as drugs and surgery. The purpose of this conference was to examine the usefulness of integrating behavioral and relaxation approaches with biomedical interventions in clinical and research settings to improve the care of patients with chronic pain and insomnia.

Assessments of more consistent and effective integration of these approaches required the development of precise definitions of the most frequently used techniques, which include relaxation, meditation, hypnosis, biofeedback (BF), and cognitive-behavioral therapy (CBT). It was also necessary to examine how these approaches have been previously used with medical therapies in the treatment of chronic pain and insomnia and to evaluate the efficacy of such integration to date.

To address these issues, the Office of Alternative Medicine and the Office of Medical Applications of Research, National Institutes of Health, convened a Technology Assessment Conference on Integration of Behavioral and Relaxation Approaches into the Treatment of Chronic Pain and Insomnia. The conference was cosponsored by the National Institute of Mental Health, the National Institute of Dental Research, the National Heart, Lung, and Blood Institute, the National Institute on Aging, the National Cancer Institute, the National Institute of Nursing Research, the National Institute of Neurological Disorders and Stroke, and the National Institute of Arthritis and Musculoskeletal and Skin Diseases.

This technology assessment conference (1) reviewed data on the relative merits of specific behavioral and relaxation interventions and identified biophysical and psychological factors that might predict the outcome of applying these techniques and (2) examined the mechanisms by which behavioral and relaxation approaches could lead to greater clinical effectiveness.

The conference brought together experts in behavioral medicine, pain medicine, sleep medicine, psychiatry, nursing, psychology, neurology,

behavioral science, and neuroscience as well as representatives from the public. After 1½ days of presentations and audience discussion, an independent, non-Federal panel weighed the scientific evidence and developed a draft statement that addressed the following five questions:

- What behavioral and relaxation approaches are used for conditions such as chronic pain and insomnia?
- How successful are these approaches?
- How do these approaches work?
- Are there barriers to the appropriate integration of these approaches into health care?
- What are the significant issues for future research and applications?

The suffering and disability from these disorders result in a heavy burden for individual patients, their families, and their communities. There is also a burden to the Nation in terms of billions of dollars lost as a consequence of functional impairment. To date, conventional medical and surgical approaches have failed— at considerable expense— to adequately address these problems. It is hoped that this technology assessment statement, which is based on rigorous examination of current knowledge and practice and makes recommendations for research and application, will help reduce suffering and improve the functional capacity of affected individuals.

# **Question 1: *What Behavioral and Relaxation Approaches Are Used for Conditions such as Chronic Pain and Insomnia?***

## **Pain**

Pain is defined by the International Association for the Study of Pain as an unpleasant sensory and emotional experience associated with actual or potential tissue damage or described in terms of such damage. It is a complex, subjective, perceptual phenomenon with a number of contributing factors that are uniquely experienced by each individual. Pain is typically classified as acute, cancer-related, and chronic nonmalignant. Acute pain is associated with a noxious event. Its severity is generally proportional to the degree of tissue injury and is expected to diminish with healing and time. Cancer-related pain presents with acute episodes plus the circumstances of chronic pain because of its duration and the psychological issues inherent with malignant disease. Chronic nonmalignant pain frequently develops following an injury but persists long after a reasonable period of healing. Its underlying causes may not be readily discernible, and the pain is disproportionate to demonstrable tissue damage. It is frequently accompanied by alteration of sleep; mood; and sexual, vocational, and avocational function.

## **Insomnia**

Insomnia may be defined as a disturbance or perceived disturbance of the usual sleep pattern of the individual that has troublesome consequences. These consequences may include daytime fatigue and drowsiness, irritability, anxiety, depression, and somatic complaints. Categories of disturbed sleep are (1) inability to fall asleep, (2) inability to maintain sleep, and (3) early awakening.

## **Selection Criteria**

A variety of behavioral and relaxation approaches are used for conditions such as chronic pain and insomnia. The specific approaches that were addressed in this technology assessment conference were selected using three important criteria. First, somatically directed therapies with behavioral components (e.g., physical therapy, occupational therapy, acupuncture) were not considered. Second, the approaches were drawn from those reported in the scientific literature.

Many commonly used behavioral approaches are not specifically incorporated into conventional medical care. For example, religious and spiritual approaches, which are among the most commonly used health-related actions by the U.S. population, were not considered in this conference. Third, the approaches are a subset of those discussed in the literature and represent those selected by the conference organizers as most commonly used in clinical settings in the United States. Several commonly used clinical interventions such as music, dance, recreational, and art therapies were not addressed.

## **Relaxation Techniques**

Relaxation techniques are a group of behavioral therapeutic approaches that differ widely in their philosophical bases as well as in their methodologies and techniques. Their primary objective is the achievement of nondirected relaxation, rather than direct achievement of a specific therapeutic goal. They all share two basic components: (1) repetitive focus on a word, sound, prayer, phrase, body sensation, or muscular activity and (2) the adoption of a passive attitude toward intruding thoughts and a return to the focus. These techniques induce a common set of physiologic changes that result in decreased metabolic activity. Relaxation techniques may also be used in stress management (as self-regulatory techniques) and have been divided into deep and brief methods.

## ***Deep Methods***

Deep methods include autogenic training, meditation, and progressive muscle relaxation (PMR). Autogenic training consists of imagining a peaceful environment and comforting bodily sensations. Six basic focusing techniques are used: heaviness in the limbs, warmth in the limbs, cardiac regulation, centering on breathing, warmth in the upper abdomen, and coolness in the forehead. Meditation is a self-directed practice for relaxing the body and calming the mind. A large variety of meditation techniques are in common use; each has its own proponents. Meditation generally does not involve suggestion, autosuggestion, or trance. The goal of mindfulness meditation is development



of a nonjudgmental awareness of bodily sensations and mental activities occurring in the present moment. Concentration meditation trains the person to passively attend to a bodily process, a word, and/or a stimulus. Transcendental meditation focuses on a “suitable” sound or thought (the mantra) without attempting to actually concentrate on the sound or thought. There are also many movement meditations, such as yoga and the walking meditation of Zen Buddhism. PMR focuses on reducing muscle tone in major muscle groups. Each of 15 major muscle groups is tensed and then relaxed in sequence.

### ***Brief Methods***

The brief methods, which include self-control relaxation, paced respiration, and deep breathing, generally require less time to acquire or practice and often represent abbreviated forms of a corresponding deep method. For example, self-control relaxation is an abbreviated form of PMR. Autogenic training may be abbreviated and converted to a self-control format. Paced respiration teaches patients to maintain slow breathing when anxiety threatens. Deep breathing involves taking several deep breaths, holding them for 5 seconds, and then exhaling slowly.

### ***Hypnotic Techniques***

Hypnotic techniques induce states of selective attentional focusing or diffusion combined with enhanced imagery. They are often used to induce relaxation and also may be a part of CBT. The techniques have pre- and postsuggestion components. The presuggestion component involves attentional focusing through the use of imagery, distraction, or relaxation, and has features that are similar to other relaxation techniques. Subjects focus on relaxation and passively disregard intrusive thoughts. The suggestion phase is characterized by introduction of specific goals; for example, analgesia may be specifically suggested. The postsuggestion component involves continued use of the new behavior following termination of hypnosis. Individuals vary widely in their hypnotic susceptibility and suggestibility, although the reasons for these differences are incompletely understood.

## Biofeedback Techniques

BF techniques are treatment methods that use monitoring instruments of various degrees of sophistication. BF techniques provide patients with physiologic information that allows them to reliably influence psychophysiological responses of two kinds: (1) responses not ordinarily under voluntary control and (2) responses that ordinarily are easily regulated but for which regulation has broken down. Technologies that are commonly used include electromyography (EMG BF), electroencephalography, thermometers (thermal BF), and galvanometry (electrodermal BF). BF techniques often induce physiological responses similar to those of other relaxation techniques.

## Cognitive-Behavioral Therapy

CBT attempts to alter patterns of negative thoughts and dysfunctional attitudes in order to foster more healthy and adaptive thoughts, emotions, and actions. These interventions share four basic components: education, skills acquisition, cognitive and behavioral rehearsal, and generalization and maintenance. Relaxation techniques are frequently included as a behavioral component in CBT programs. The specific programs used to implement the four components can vary considerably.

Each of the aforementioned therapeutic modalities may be practiced individually, or they may be combined in multimodal approaches to manage chronic pain or insomnia.

## Relaxation and Behavioral Techniques for Insomnia

Relaxation and behavioral techniques corresponding to those used for chronic pain may also be used for specific types of insomnia. Cognitive relaxation, various forms of BF, and PMR may all be used to treat insomnia. In addition, the following behavioral approaches are generally used to manage insomnia:

**Sleep hygiene**, which involves educating patients about behaviors that may interfere with the sleep process, with the hope that education about maladaptive behaviors will lead to behavioral modification.

**Stimulus control therapy**, which seeks to create and protect a conditioned association between the bedroom and sleep. Activities in the bedroom are usually restricted to sleep and sex.

**Sleep restriction therapy**, in which patients provide a sleep log and are then asked to stay in bed only as long as they think they are currently sleeping. This usually leads to sleep deprivation and consolidation, which may be followed by a gradual increase in the length of time in bed.

**Paradoxical intention**, in which the patient is instructed not to fall asleep, with the expectation that efforts to avoid sleep will in fact induce it.

## Question 2: *How Successful Are These Approaches?*

### Pain

A plethora of studies using a range of behavioral and relaxation approaches to treat chronic pain are reported in the literature. The measures of success reported in these studies depend on the rigor of the research design, the population studied, the length of followup, and the outcome measures identified. As the number of well-designed studies using a variety of behavioral and relaxation techniques grows, the use of meta-analysis as a means of examining the overall effectiveness will increase.

One carefully analyzed review of studies on chronic pain, including cancer pain, was prepared under the auspices of the U.S. Agency for Health Care Policy and Research (AHCPR) in 1990. A great strength of the report was the careful categorization of the evidential basis of each intervention. The categorization was based on design of the studies and consistency of findings among the studies. These properties led to the development of a 4-point scale that ranked the evidence as strong, moderate, fair, or weak; this scale was used by the panel report to evaluate the AHCPR studies.

Evaluation of behavioral and relaxation interventions for chronic pain reduction in adults found the following:

**Relaxation:** The evidence is strong for the effectiveness of this class of techniques in reducing chronic pain in a variety of medical conditions.

**Hypnosis:** The evidence supporting the effectiveness of hypnosis in alleviating chronic pain associated with cancer seems strong. In addition, the panel was presented with other data suggesting the effectiveness of hypnosis in other chronic pain conditions, which include irritable bowel syndrome, oral mucositis, temporomandibular disorders, and tension headaches.

**CBT:** The evidence was moderate for the usefulness of CBT in chronic pain. In addition, a series of eight well-designed studies found CBT superior to placebo and to routine care for alleviating

low back pain and both rheumatoid arthritis and osteoarthritis-associated pain, but inferior to hypnosis for oral mucositis and to EMG BF for tension headache.

**BF:** The evidence is moderate for the effectiveness of BF in relieving many types of chronic pain. Data were also reviewed showing EMG BF to be more effective than psychological placebo for tension headache but equivalent in results to relaxation. For migraine headache, BF is better than relaxation therapy and better than no treatment, but superiority to psychological placebo is less clear.

**Multimodal Treatment:** Several meta-analyses examined the effectiveness of multimodal treatments in clinical settings. The results of these studies indicate a consistent positive effect of these programs on several categories of regional pain. Back and neck pain, dental or facial pain, joint pain, and migraine headaches have all been treated effectively.

Although relatively good evidence exists for the efficacy of several behavioral and relaxation interventions in the treatment of chronic pain, the data are insufficient to conclude that one technique is usually more effective than another for a given condition. For any given individual patient, however, one approach may indeed be more appropriate than another.

## Insomnia

Behavioral treatments produce improvements in some aspects of sleep, the most pronounced of which are for sleep latency and time awake after sleep onset. Relaxation and BF were both found to be effective in alleviating insomnia. Cognitive forms of relaxation such as meditation were slightly better than somatic forms of relaxation such as PMR. Sleep restriction, stimulus control, and multimodal treatment were the three most effective treatments in reducing insomnia. No data were presented or reviewed on the effectiveness of CBT or hypnosis. Improvements seen at treatment completion were

maintained at followups averaging 6 months in duration. Although these effects are statistically significant, it is questionable whether the magnitude of the improvements in sleep onset and total sleep time are clinically meaningful. It is possible that a patient-by-patient analysis might show that the effects were clinically valuable for a special set of patients, as some studies suggest that patients who are readily hypnotized benefited much more from certain treatments than other patients did. No data were available on the effects of these improvements on patient self-assessment of quality of life.

To adequately evaluate the relative success of different treatment modalities for insomnia, two major issues need to be addressed. First, valid objective measures of insomnia are needed. Some investigators rely on self-reports by patients, whereas others believe that insomnia must be documented electrophysiologically. Second, what constitutes a therapeutic outcome should be determined. Some investigators use only time until sleep onset, number of awakenings, and total sleep time as outcome measures, whereas others believe that impairment in daytime functioning is perhaps a more important outcome measure. Both of these issues require resolution so that research in the field can move forward.

## Critique

Several cautions must be considered threats to the internal and external validity of the study results. The following problems pertain to internal validity: (1) full and adequate comparability among treatment contrast groups may be absent; (2) the sample sizes are sometimes small, lessening the ability to detect differences in efficacy; (3) complete blinding, which would be ideal, is compromised by patient and clinician awareness of the treatment; (4) the treatments may not be well described, and adequate procedures for standardization such as therapy manuals, therapist training, and reliable competency and integrity assessments have not always been carried out; and (5) a potential publication bias, in which authors exclude studies with small effects and negative results, is of concern in a field characterized by studies with small numbers of patients.

With regard to the ability to generalize the findings of these investigations, the following considerations are important:

- The patients participating in these studies are usually not cognitively impaired. They must be capable not only of participating in the study treatments but also of fulfilling all the requirements of participating in the study protocol.
- The therapists must be adequately trained to competently conduct the therapy.
- The cultural context in which the treatment is conducted may alter its acceptability and effectiveness.

In summary, this literature offers substantial promise and suggests a need for prompt translation into programs of health care delivery. At the same time, the state of the art of the methodology in the field of behavioral and relaxation interventions indicates a need for thoughtful interpretation of these findings. It should be noted that similar criticisms can be made of many conventional medical procedures.

## Question 3: *How Do These Approaches Work?*

The mechanism of action of behavioral and relaxation approaches can be considered at two levels: (1) determining how the procedure works to reduce cognitive and physiological arousal and to promote the most appropriate behavioral response and (2) identifying effects at more basic levels of functional anatomy, neurotransmitter and other biochemical activity, and circadian rhythms. The exact biological actions are generally unknown.

### **Pain**

There appear to be at least two pain transmission circuits. Some data suggest that a spinal cord-thalamic-frontal cortex-anterior cingulate pathway plays a role in the subjective psychological and physiological responses to pain, whereas a spinal cord-thalamic-somatosensory cortex pathway plays a role in pain sensation. A descending pathway involving the periaqueductal gray region modulates pain signals (pain modulation circuit). This system can augment or inhibit pain transmission at the level of the dorsal spinal cord. Endogenous opioids are particularly concentrated in this pathway. At the level of the spinal cord, serotonin and norepinephrine also appear to play important roles.

Relaxation techniques as a group generally alter sympathetic activity as indicated by decreases in oxygen consumption, respiratory and heart rate, and blood pressure. Increased electroencephalographic slow wave activity has also been reported. Although the mechanism for the decrease in sympathetic activity is unclear, one may infer that decreased arousal (due to alterations in catecholamines or other neurochemical systems) plays a key role.

Hypnosis, in part because of its capacity for evoking intense relaxation, has been shown to help reduce several types of pain (e.g., lower back and burn pain). Hypnosis does not appear to influence endorphin production, and its role in the production of catecholamines is not known. Hypnosis has been hypothesized to block pain from entering consciousness by activating the frontal-limbic attention system to inhibit pain impulse transmission from thalamic to cortical structures. Similarly, other CBT may decrease transmission through

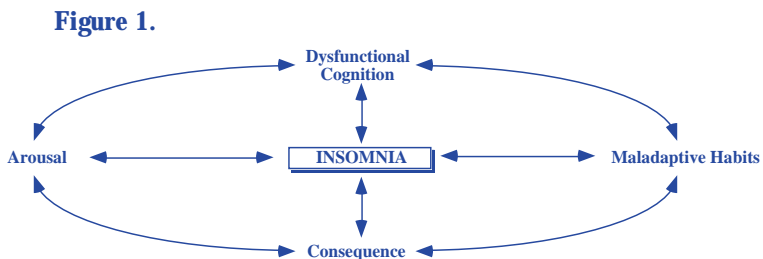


this pathway. Moreover, the overlap in brain regions involved in pain modulation and anxiety suggests a possible role for CBT approaches affecting this area of function, although data are still evolving.

CBT also appears to exert a number of other effects that could alter pain intensity. Depression and anxiety increase subjective complaints of pain, and cognitive-behavioral approaches are well documented for decreasing these affective states. In addition, these types of techniques may alter expectation, which also plays a key role in subjective experiences of pain intensity. They also may augment analgesic responses through behavioral conditioning. Finally, these techniques help patients enhance their sense of self control over their illness enabling them to be less helpless and better able to deal with pain sensations.

## Insomnia

A cognitive-behavioral model for insomnia (see Figure 1) elucidates the interaction of insomnia with emotional, cognitive, and physiologic arousal; dysfunctional conditions, such as worry over sleep; maladaptive habits (e.g., excessive time in bed and daytime napping); and the consequences of insomnia (e.g., fatigue and impairment in performance of activities).



Morin CM (1993) *Insomnia* - The Guilford Press. Adapted from presentation by D.J. Buysse, M.D. at NIH Technology Assessment Conference 10-17-95.

In the treatment of insomnia, relaxation techniques have been used to reduce cognitive and physiological arousal and thus assist the induction of sleep as well as decrease awakenings during sleep.

Relaxation is also likely to influence decreased activity in the entire sympathetic system, permitting a more rapid and effective “deafferentation” at sleep onset at the level of the thalamus. Relaxation may also enhance parasympathetic activity, which in turn will further decrease autonomic tone. In addition, it has been suggested that alterations in cytokine activity (immune system) may play a role in insomnia or in response to treatment.

Cognitive approaches may decrease arousal and dysfunctional beliefs and thus improve sleep. Behavioral techniques including sleep restriction and stimulus control can be helpful in reducing physiologic arousal, reversing poor sleep habits, and shifting circadian rhythms. These effects appear to involve both cortical structures and deep nuclei (e.g., locus ceruleus and suprachiasmatic nucleus). Knowing the mechanisms of action would reinforce and expand use of behavioral and relaxation techniques, but incorporation of these approaches into the treatment of chronic pain and insomnia can proceed on the basis of clinical efficacy, as has occurred with adoption of other practices and products before their mode of action was completely delineated.

## **Question 4: *Are There Barriers to the Appropriate Integration of These Approaches into Health Care?***

One barrier to the integration of behavioral and relaxation techniques in standard medical care has been the emphasis solely on the biomedical model as the basis of medical education. The biomedical model defines disease in anatomic and pathophysiologic terms. Expansion to a biopsychosocial model would increase emphasis on a patient's experience of disease and balance the anatomic/physiologic needs of patients with their psychosocial needs.

For example, of six factors identified to correlate with treatment failures of low back pain, all are psychosocial. Integration of behavioral and relaxation therapies with conventional medical procedures is necessary for the successful treatment of such conditions. Similarly, the importance of a comprehensive evaluation of a patient is emphasized in the field of insomnia where failure to identify a condition such as sleep apnea may result in inappropriate application of a behavioral therapy. Therapy should be matched to the illness and to the patient.

Integration of psychosocial issues with conventional medical approaches will necessitate the application of new methodologies to assess the success or failure of the interventions. Therefore, additional barriers to integration include lack of standardization of outcome measures, lack of standardization or agreement on what constitutes successful outcome, and lack of consensus on what constitutes appropriate followup. Methodologies appropriate for the evaluation of drugs may not be adequate for the evaluation of some psychosocial interventions, especially those involving patient experience and quality of life. Psychosocial research studies must maintain the high quality of those methods that have been painstakingly developed over the last few decades. Agreement needs to be reached for standards governing the demonstration of efficacy for psychosocial interventions.

Psychosocial interventions are often time-intensive, creating potential blocks to provider and patient acceptance and compliance. Participation in BF training typically includes up to 10–12 sessions of approximately 45 minutes to 1 hour each. In addition, home practice of these techniques is usually required. Thus, patient compliance and both patient and provider willingness to participate in these therapies will have to be addressed. Physicians will have to be educated on the

efficacy of these techniques. They must also be willing to educate their patients about the importance and potential benefits of these interventions and to provide encouragement for the patient through training processes.

Insurance companies can provide either a financial incentive or barrier to access of care depending on their willingness to provide reimbursement. Insurance companies have traditionally been reluctant to reimburse for some psychosocial interventions and reimburse others at rates below those for standard medical care. Psychosocial interventions for pain and insomnia should be reimbursed as part of comprehensive medical services at rates comparable to those for other medical care, particularly in view of data supporting their effectiveness and data detailing the costs of failed medical and surgical interventions.

The evidence suggests that sleep disorders are significantly underdiagnosed. The prevalence and possible consequences of insomnia have begun to be documented. There are substantial disparities between patient reports of insomnia and the number of insomnia diagnoses, as well as between the number of prescriptions written for sleep medications and the number of recorded diagnoses of insomnia. Data indicate that insomnia is widespread, but the morbidity and mortality of this condition are not well understood. Without this information, it remains difficult for physicians to gauge how aggressive their intervention should be in the treatment of this disorder. In addition, the efficacy of the behavioral approaches for treating this condition has not been adequately disseminated to the medical community.

Finally, who should be administering these therapies? Problems with credentialing and training have yet to be completely addressed in the field. Although the initial studies have been done by qualified and highly trained practitioners, the question remains as to how this will best translate into delivery of care in the community. Decisions will have to be made about which practitioners are best qualified and most cost-effective to provide these psychosocial interventions.

## **Question 5: *What Are the Significant Issues for Future Research and Applications?***

Research efforts on these therapies should include additional efficacy and effectiveness studies, cost-effectiveness studies, and efforts to replicate existing studies. Several specific issues should be addressed:

### **Outcomes**

- Outcome measures should be reliable, valid, and standardized for behavioral and relaxation interventions research in each area (chronic pain, insomnia) so that studies can be compared and combined.
- Qualitative research is needed to help determine patients' experiences with both insomnia and chronic pain and their treatments.
- Future research should include examination of consequences/outcomes of untreated chronic pain and insomnia; chronic pain and insomnia treated pharmacologically versus with behavioral and relaxation therapies; and combinations of pharmacologic and psychosocial treatments for chronic pain and insomnia.

### **Mechanism(s) of Action**

- Advances in the neurobiological sciences and psychoneuroimmunology are providing an improved scientific base for understanding mechanisms of action of behavioral and relaxation techniques and need to be further investigated.

### **Covariates**

- Chronic pain and insomnia, as well as behavioral and relaxation therapies, involve factors such as values, beliefs, expectations, and behaviors, all of which are strongly shaped by one's culture. Research is needed to assess cross-cultural applicability, efficacy, and modifications of psychosocial therapeutic modalities.

- Research studies that examine behavioral and relaxation approaches to insomnia and chronic pain should consider the influence of age, race, gender, religious belief, and socioeconomic status on treatment efficacy.

### **Health Services**

- The most effective timing of the introduction of behavioral interventions into the course of treatment should be studied.
- Research is needed to optimize the match between specific behavioral and relaxation techniques and specific patient groups and treatment settings.

### **Integration Into Clinical Care and Medical Education**

- New and innovative methods of introducing psychosocial treatments into health care curricula and practice should be investigated.

## *Conclusions*

A number of well-defined behavioral and relaxation interventions are now available, some of which are commonly used to treat chronic pain and insomnia. Available data support the effectiveness of these interventions in relieving chronic pain and in achieving some reduction in insomnia. Data are currently insufficient to conclude with confidence that one technique is more effective than another for a given condition. For any given individual patient, however, one approach may indeed be more appropriate than another.

Behavioral and relaxation interventions clearly reduce arousal, and hypnosis reduces pain perception. However, the exact biological underpinnings of these effects require further study, as is often the case with medical therapies. The literature demonstrates treatment effectiveness, although the state of the art of the methodologies in this field indicates a need for thoughtful interpretation of the findings along with prompt translation into programs of health care delivery.

Although specific structural, bureaucratic, financial, and attitudinal barriers exist to the integration of these techniques, all are potentially surmountable with education and additional research, as patients shift from being passive participants in their treatment to becoming responsible, active partners in their rehabilitation.

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## Speakers

**Herbert Benson, M.D.**

“The Common Physiological Events That Occur When Behavioral and Relaxation Approaches Are Practiced by Patients”

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**Edward B. Blanchard, Ph.D.**

“Biofeedback and its Role in the Treatment of Pain”

*Distinguished Professor of Psychology*

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**Laurence A. Bradley, Ph.D.**

“Cognitive Intervention Strategies for Chronic Pain: Assumptions Underlying Cognitive Therapy”

*Professor of Medicine*  
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Division of Clinical Immunology and Rheumatology  
University of Alabama at Birmingham School of Medicine  
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**Daniel J. Buysse, M.D.**

“Potential Mechanisms of Action of Behavioral and Relaxation Treatments in Insomnia”

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**Helen J. Crawford, Ph.D.**

“Use of Hypnotic Techniques in the Control of Pain: Neuropsychophysiological Foundation and Evidence”

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# INTEGRATION OF BEHAVIORAL AND RELAXATION APPROACHES INTO THE TREATMENT OF CHRONIC PAIN AND INSOMNIA

*A Continuing Medical Education Activity Sponsored by the National Institutes of Health*

## OBJECTIVE

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The objective of this NIH Technology Assessment Statement is to inform the biomedical research and clinical practice communities of the results of the NIH Technology Assessment Conference on Integration of Behavioral and Relaxation Approaches Into the Treatment of Chronic Pain and Insomnia. The statement provides state-of-the-art information regarding these techniques and their role in treating chronic pain and insomnia, and presents the conclusions and recommendations of the technology assessment panel regarding these issues. In addition, the statement identifies those areas of study that deserve further investigation. Upon completing this educational activity, the reader should possess a clear working clinical knowledge of the state-of-the-art regarding this topic.

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1. Which of the following is NOT a characteristic of chronic pain?
- a. persists beyond a reasonable period of healing
  - b. pain is proportionate to demonstrable tissue damage
  - c. frequently develops from an acute injury
  - d. frequently accompanied by alterations in sleep

**ANSWER** \_\_\_\_\_

2. Categories of disturbed sleep include:
- a. inability to fall asleep
  - b. inability to maintain sleep
  - c. early awakening
  - d. all of the above

**ANSWER** \_\_\_\_\_

3. All relaxation techniques share which of the following basic components?  
*(You must indicate all that are true.)*
- a. achievement of nondirected relaxation and a specific therapeutic goal
  - b. repetitive focus on a word, sound, prayer, phrase, body sensation, or muscular activity
  - c. the adoption of a passive attitude toward intruding thoughts and a return to focus

**ANSWER(S)** \_\_\_\_\_

4. Which of the following is NOT considered a brief method of relaxation?
- a. self-control relaxation
  - b. autogenic training
  - c. deep breathing
  - d. paced respiration

**ANSWER** \_\_\_\_\_

5. Which of the following is NOT a component of hypnosis?
- a. attentional focusing through the use of imagery, distraction, or relaxation
  - b. introduction of specific goals
  - c. surrendering control to a hypnoterapist
  - d. continued use of new behavior

**ANSWER** \_\_\_\_\_

6. Cognitive-behavioral therapy interventions include:  
*(You must indicate all that are true.)*
- a. education
  - b. skills acquisition
  - c. cognitive and behavioral rehearsal
  - d. generalization and maintenance

**ANSWER(S)** \_\_\_\_\_

7. For which of the following behavioral medicine interventions did the panel find strong evidence for effectiveness? (*You must indicate all that are true.*)
- a. biofeedback for headache treatment
  - b. hypnosis in the treatment of pain associated with cancer
  - c. relaxation for chronic pain
  - d. cognitive-behavioral therapy for chronic pain

**ANSWER(S)** \_\_\_\_\_

8. Which of the following is NOT an effective treatment for reducing insomnia?
- a. sleep restriction
  - b. progressive muscle relaxation
  - c. stimulus control
  - d. multimodal treatment

**ANSWER** \_\_\_\_\_

9. Which of the following were identified by the panel as pain transmission pathways? (*You must indicate all that are true.*)
- a. spinal cord–nucleus tractus solitarius–hypothalamic cortex pathway
  - b. spinal cord–thalamic–frontal cortex–anterior cingulate pathway
  - c. spinal cord–hypothalamus–hippocampal pathway
  - d. spinal cord–thalamic–somatosensory cortex pathway

**ANSWER(S)** \_\_\_\_\_

10. Relaxation techniques as a group work by:
- a. increasing sympathetic activity
  - b. reducing parasympathetic activity
  - c. reducing sympathetic activity
  - d. increasing muscle tension

**ANSWER** \_\_\_\_\_

11. Which of the following is a key to altering subjective experiences of pain?
- a. learning to repress negative emotions
  - b. cathartic venting
  - c. alteration of expectations
  - d. redirecting depression

**ANSWER** \_\_\_\_\_

12. Which of the following brain structures are affected by behavioral techniques such as sleep restriction and stimulus control?
- a. locus ceruleus and suprachiasmatic nucleus
  - b. brainstem and pineal body
  - c. amygdala and hippocampus
  - d. suprachiasmatic nucleus and hippocampus

**ANSWER** \_\_\_\_\_



13. Which of the following is NOT a barrier to the integration of behavioral interventions into medical care?
- a. reimbursement from insurance companies
  - b. emphasis on the biopsychosocial model in medicine
  - c. lack of standardization of outcome measures
  - d. lack of dissemination of empirical studies

**ANSWER** \_\_\_\_\_

Your answer to the following two questions is optional and will have no effect on the grading results of this test.

Was the objective of this continuing education activity clearly stated?

- a. not at all
- b. very little
- c. somewhat
- d. considerably
- e. completely

**ANSWER** \_\_\_\_\_

Did the activity planners provide the necessary information to meet the stated goals and objectives?

- a. not at all
- b. very little
- c. somewhat
- d. considerably
- e. completely

**ANSWER** \_\_\_\_\_

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