WHO/MNH/PSF/93.2H
English only
Distr. General

INSOMNIA

BEHAVIOURAL AND COGNITIVE INTERVENTIONS

BEHAVIOURAL SCIENCE
LEARNING MODULES

DIVISION OF MENTAL HEALTH

WORLD HEALTH ORGANIZATION

GENEVA

Further copies of this document may be obtained from

Division of Mental Health
World Health Organization
1211 Geneva 27
Switzerland

INSOMNIA
BEHAVIOURAL AND COGNITIVE INTERVENTIONS

Francis J. Riba, Ph.D. (*)

Introduction

Insomnia is a problem for a large percentage of the general population. In Switzerland, a relatively recent epidemiological survey (Borbely, 1984) demonstrated that 79.2% of the population evaluated their sleep as "very good", or "good" whereas 16.9% considered their sleep as "average", 3.1% "poor" and 0.8% "very poor". It was also correlated that insomnia was more common among women and older individuals.

Epidemiological surveys conducted in the United States indicate that between 10 to 15% of the population state that they have frequent or severe insomnia; another 10 to 15% state that they have mild or occasional insomnia (Kales et al., 1974; Montgomery et al., 1975; Webb, 1975). In one U.S. nationwide survey, which included more than 6,000 adults, insomnia was a problem "at least sometimes" for 40% of the women and for 30% of the men (US Dept. of Health, Education and Welfare, 1970). In another survey which was conducted in the United States with over a million people, 21% of the respondents indicated a prevalence of difficulty in sleeping (Hammond, 1964). Because of its high prevalence in the general population, insomnia is understandably one of the most common disorders encountered in medical practice (Johns, 1972).

Diagnosis

Insomnia is the term applied collectively to complaints involving the chronic inability to obtain adequate sleep. Three principal complaints commonly cited are (1) sleep onset insomnia (difficulty in falling asleep), (2) frequent nocturnal awakening (interrupted sleep characterized by frequent awakenings) and (3) early morning awakening (waking up early in the morning and not being able to fall back asleep) (Karacan and Williams, 1971).

In sleep laboratories, standard criteria have evolved for each of these types of insomnia. Thus, insomnia is typically defined as taking longer than 30 minutes to fall asleep, awakenings during the night totalling more than 30 minutes of wakefulness, and less than 6.5 hours of total sleep (Dement and Guilleminault, 1973). In addition to reporting that sleep is disturbed, the important criterion of daytime fatigue must be present. Thus a person whose sleep is fitful and restless but functions well during the day would not be considered suffering from insomnia.

(*) The material that was used to prepare the background document on "Insomnia: Behavioural and Cognitive Interventions" was drawn from a training videotape on "Les Troubles du Sommeil en Pratique Générale" produced at the University Hospital of Geneva in Switzerland by the Interdisciplinary Group for the Development of Training Materials for the Management by Non-Psychiatrist Physicians of Mental Health Problems in their Patients. The members of the group include:

Prof F. Waldvogel, chef du département de Médecine Interne, Hôpital Cantonal Universitaire de Genève.

Dr Th. Hovaguimian, médecin consultant aux Institutions Universitaires de Psychiatrie de Genève.

Dr J. Dubuis, médecin consultant aux Institutions Universitaires de Psychiatrie de Genève.

Prof G. Garrone, médecin-chef aux Institutions Universitaires de Psychiatrie de Genève.

Prof A. Haynal, médecin-chef aux Institutions Universitaires de Psychiatrie de Genève.

Dr P.A. Naville, médecin consultant au département de Médecine Interne, Hôpital Cantonal Universitaire de Genève.

Dr M.A. Raetzo, médecin consultant au département de Médecine Interne, Hôpital Cantonal Universitaire de Genève.

F.J. Riba, Ph.D. en psychologie, consultant temporaire à la Clinique médicale thérapeutique, Hôpital Cantonal Universitaire de Genève.

The procedure for diagnosing insomnia begins with the search for a possible association between the complaint of sleeping poorly and a difficulty in functioning during the day. Having established that the complaint of sleeping poorly is linked to difficulty in functioning during the day, the health worker may decide that this is a case of insomnia for which he must now search for the cause or causes.

The causes of insomnia can be classified into the following major categories (see Appendix A):

Physical causes

Insomnia may be caused by a large variety of physical causes. As the best treatment for these is treating the primary cause, these should be excluded before embarking on to treatment. The following conditions are commonly associated with insomnia

Common syndrome

Parkinson's disease
Congenital heart failure
Hyperthyroidism
Hypothyroidism
Hepatic insufficiency
Renal insufficiency
Dementia
Iatrogenic hypoglycaemia in poorly controlled diabetics mellitus
Cor pulmonale
Hypertension
Endocrine disorders
Intestinal parasites
Skin infestations
Restless leg syndrome
Sleep apnoea

Painful situations

Orthopaedic pain such as low back pain, fractures, or pain due to bony metastasis
Rheumatic pain
Neuralgia
Cramps
Renal colic
Itching
Menopausal hot flushes

Situations causing nocturnal discomfort

Dyspnoea
Nocturia
Too warm or too cold environmental temperatures

Drug withdrawal

Tranquillisers
Analgesics
Tobacco
Alcohol
Any medicine affecting CWS may cause insomnia in withdrawal

Drug-related causes

In taking the patient's drug history it is important to know that drugs other than those known for their stimulant effects may be responsible; these include the anorexigenics, some antidepressants, thyroid hormones and sympathomimetics (Kales et al., 1970). It should also be borne in mind that diuretics taken too late in the day, corticosteroids in some cases, and lipophilic beta-blockers that readily pass the blood-brain barrier may also induce insomnia (Kay et al., 1976).

Reserpine can also disturb sleep by causing nightmares, and even hypnotics may cause insomnia if improperly used (Kales et al., 1975). The improper use of a sleeping pill may lead to habituation, induce a reduction of slow deep sleep, a fragmentation of sleep and a reduction of the paradoxical stage. Also any anticholinergic may cause insomnia. Actually any drug penetrating the blood brain barrier may cause insomnia.

Mental causes

Among the mental causes of insomnia, the health care worker may meet psychiatric diseases or encounter disturbing psychosocial occurrences whose effects are generally temporary.

The following psychiatric causes of insomnia are encountered in general practice, in order of frequency: depressions, anxiety, schizophrenia, obsessional neurosis, hypomania and mental anorexia (Coursey et al., 1975; Marks, 1982).

It is also necessary to consider chronic alcoholism or drug addiction, which are less spontaneously revealed (Monroe, 1967; Rundell et al., 1972).

Among the mental causes it is also necessary to consider the important role of certain psychosocial occurrences that involve a crisis or a loss and which may lead to sleep disorders without necessarily causing frank psychiatric disorders (Nicassio & Bootzin, 1974).

Behavioural causes

Many insomnias have their origin in a lifestyle or in a particular habit. For example, there are some people who prevent themselves from acquiring a regular nyctohemeral rhythm by taking naps or getting up at different times in the morning.

Another habit harmful to sleep is to engage in stimulating activities around bedtime. Intensive physical or intellectual activity may in many cases be incompatible with preparation for sleep.

Some substances can also play a considerable part: susceptibility to the stimulating influence of caffeine or nicotine varies considerably from one person to another. While it is true that alcohol may help people get to sleep, it can also make them wake up several times during the night, which results in a reduction in total sleeping time (Johnson et al., 1970; Mello & Mendelson, 1970).

Finally, doctors do not always think of asking insomniacs about any disturbing factors in their sleeping environment.

Besides lifestyles or habits there are also states of mind that can be harmful to sleep.

Behavioural theories refer to conditioned insomnia when the patient, after spending many hours in bed painfully mulling over unpleasant events, ends up associating his sleeping environment with a state of wakefulness. This conditioning may perpetuate the insomnia well after the psychosocial problems have been solved. Typically these insomniacs find they sleep well in environments other than their bedroom, for example, the living room or a hotel (Bootzin & Engle-Friedman, 1981).

Other states of mind may be just as harmful. The patient who is convinced that he absolutely has to sleep and endeavors to do so at any cost puts himself in a state of wakefulness that prevents him from getting to sleep (Hauri, 1975).

Finally, insomnia may also occur due to a combination of the above-mentioned causes.

Summary

The diagnostic approach to an insomnia is complete when the following three components are all present:

1. Complaint of sleeping badly expressed by the patient

   - Sleep onset greater than 30 minutes
   - Awake during the night more than 30 minutes

2. Observation of difficulty functioning in the daytime

   - Daytime fatigue and drowsiness
   - Trouble concentrating
   - Irritability

3. Identification of a recognized cause of insomnia

   - Physical problems
   - Drug history
   - Psychiatric disorder or psychosocial problem
   - Lifestyle that affects sleep
   - State of mind that perpetuates the insomnia

If all three components are present then it is possible to safely diagnose insomnia and begin treatment.

However, if the cause for the patient's insomnia is not found, it is obviously impossible to treat it etiologically. In this case the investigations need to be taken further with the aid of a specialist.

If the patient only displays difficulty functioning in the daytime, with no complaint of sleeping badly, you cannot diagnose insomnia. Here again, additional investigations will be needed to look for other causes of the patient's fatigue or drowsiness. A sleep recording is then generally indicated in order to reach a definite diagnosis.

Finally, if the patient complains of sleeping badly, with no difficulty functioning in the daytime and no identifiable cause, the complaints probably arise from a mistaken idea of sleep requirements or a poor assessment of sleep. The response given to the patient should be of an educational nature.

Rationale and effectiveness of behavioural treatments

Until recently, the most common method for treating insomnia has been exclusively pharmacological, employing sedatives, tranquillizers, and hypnotics.

However, several investigators have reported that the regular use of these drugs for more than two weeks may in some cases lead to a loss of effectiveness, disturbance of the quality of sleep with the possibility of psychological dependence (Kales & Kales, 1973; Karacan & Williams, 1971; Oswald, 1968).

In the past few years, researchers have been investigating alternative non-drug behavioural techniques for the treatment of

insomnia. These include relaxation techniques such as progressive relaxation, hypnosis, autogenic training, and biofeedback.

As treatments for insomnia, all of these approaches are based on the same premise: the reduction of anxiety and physiological arousal.

A number of studies that compared insomniacs and normal sleepers have shown that poor sleepers scored much higher on tests that measured anxiety and depression (Coursey et al., 1975; Haynes et al., 1974; Nicassio & Bootzin, 1974). This view is supported by Monroe (1967) which demonstrated that insomniacs have higher levels of physiological arousal compared to good sleepers.

Considering that the insomniac appears to be a highly physiologically aroused person, it is reasonable that behaviour therapies originally derived for the reduction of anxiety might be extended to the treatment of insomnia.

Progressive relaxation

The most common way of employing relaxation to reduce physiological arousal levels is through the use of progressive relaxation. This technique was developed by Jacobson (1964) and involves a systematic tensing and relaxing of various muscle groups. Laboratory tests (Johnson & Spielberger, 1968; Edelman, 1970) have confirmed the effectiveness of this approach in lowering autonomic arousal and anxiety in general in insomniacs.

Furthermore, sleep onset time (i.e. the time needed to fall asleep) has been reduced to an average of 50% (Steinmark & Borkovec, 1974; Freedman & Papsdorf, 1976).

Hypnosis

Hypnosis, and in particular post-hypnotic suggestion, has also been successfully applied to the alleviation of insomnia (Fry, 1963; Hanley, 1965).

Autogenic training

This form of relaxation developed by Schultz and Luthe (1959) involves repetitions of verbal formulas and passive concentration on specific muscle groups to induce feelings of warmth or heaviness. In a comparative study conducted by Nicassio and Bootzin (1974), autogenic training was found to be as effective as and equivalent to progressive relaxation in the treatment of insomnia.

Biofeedback

Biofeedback training consists of using frontalis EMG feedback to induce deep muscle relaxation (Nicassio et al., 1976). Research on biofeedback and insomnia has thus far been on the level of the pilot study and case report. Although encouraging results have been reported by Raskin et al., (1973), the efficacy of biofeedback relaxation for the treatment of insomnia has still to be researched.

Summary

It is clear from the above-mentioned studies that relaxation training in general is effective in reducing sleep-onset time and several physiological measures in the insomniac.

Nevertheless, none of these approaches has produced an entirely successful treatment for insomnia. Chronic insomniacs were still taking about an hour to fall asleep after relaxation treatment, even though in one study they had improved 44% in sleep latency (Nicassio and Bootzin, 1974). Despite reduced muscle tension or arousal through relaxation training, there is little evidence to assess the contribution of such effects to the reduction of insomnia (Borkovec & Fowles, 1973).

While relaxation training will remain an important and integral part of a behavioural treatment programme for insomnia, it is clearly not enough for most insomniacs.

Rationale and effectiveness of stimulus control

Following the research on relaxation techniques, the second most studied technique for the reduction of insomnia is stimulus control (Bootzin, 1972, 1977). In general, this technique has shown the highest rates of effectiveness in the treatment of insomnia compared to other behavioural techniques. (Haynes et al., 1975; Turner & Ascher, 1979; Zwart & Lisman, 1979; Lawrence & Tokarz, 1976). Specifically, these studies showed that after treatment chronic insomniacs averaged less than 25 minutes a night to fall asleep.

The basic goals of the stimulus control technique are to restore the bed to its function as a sleep-inducing signal and conversely to weaken its link as a cue for activities that are incompatible with sleep and finally to acquire a consistent sleep rhythm. The major elements of the programme include:

- Sleep education
- Self-monitoring
- Sleep hygiene
- Specific instructions

A description of such a programme follows.

Stimulus Control Programme

A description of a four-week stimulus control programme for the treatment of insomnia is presented in this section. Before beginning the programme the patient should have a consultation with a physician to determine if:

1) the insomnia is not caused by any medical condition which may require another form of treatment (obviously patients with unstable medical conditions and fluctuating psychoactive medications are not ideal candidates for this programme);
2) previous medication for other medical conditions is not contributing to the insomnia;
3) the patient is currently withdrawing from any sleep medication.

In the best of circumstances, the patient would begin the programme and fill out the baseline Pre-Sleep and Post-Sleep diaries after withdrawal from hypnotic drugs. However, this will not always be possible, so a compromise would have to be found in which the programme would begin while the patient gradually withdraws from the sleep medication.

Session 1

The aims of the first session are to introduce the programme to the patient, present facts about the presenting problem and the treatment, include a short description of the research, a rationale for the therapy, previews of the upcoming procedures, enhance expectations of success in a realistic manner, and introduce sleep/wake self-monitoring forms.

Basic knowledge on sleep is introduced and any false beliefs or misconceptions about sleep should be corrected. For example, while sleep is essential to good health, many people are overly concerned about occasional sleep loss - which won't hurt them - or about how much they sleep. While eight hours a night is average, not everyone requires the same amount of sleep. Some need only four hours, but others need as much as ten. Also, the older a person becomes it is perfectly natural that the body requires less sleep.

The main rationale for the programme is that sleeping is something that we do so often that it becomes a habit. We all exhibit habitual behaviours. For example, we often feel hungry around 12 o'clock even if we had a late breakfast. If we have a sleeping problem it is often due to bad habits which become associated with not sleeping. For instance, we might decide to watch television in bed or discuss disturbing topics in the bedroom late in the evening. Other bad habits that would disturb our sleep would include going to bed angry or with worries. The goal of the treatment is to develop new attitudes and cultivate habits that will facilitate sleep.

All patients should receive the Pre-Sleep and Post-Sleep Insomnia Assessment Diaries (see Appendix B, C, D & E). Without belaboring this phase, patients must be able to participate in monitoring and reliably report their sleep-wake habits. These diaries and a sleep log have been included to provide an inexpensive and nonintrusive means for the patient to subjectively measure initial sleep/activity patterns and monitor therapeutic progress. It should be explained that self-monitoring is very important for behaviour change, and it should be emphasized that the most successful patients in this programme are those who regularly and accurately monitor their behaviour.

Session 2

The main aims of this session are to present and review the basic sleep hygiene rules and introduce the stimulus control instructions.

Concerning the sleep hygiene rules (see Appendix F), it is important to elaborate each rule with the patient and discuss possible ways of implementation.

Rule 1: Lie down intending to go to sleep only when you are sleepy. But have a consistent time when you plan to go to sleep.

Too often people go to bed not because their body is tired but because the clock says it is time to go to bed. If this happens often, insomnia can become chronic, so that the person has trouble sleeping even when they are tired. It is important to let the body decide when it is sleepy and only then should the person go to bed. For some people it will be necessary to teach them how to become more aware and recognize their own sleepiness.

Rule 2: Never use the bedroom for anything but sleep or sex. No activities in bed like reading, watching television, eating, talking on the telephone or discussing problems.

It is important that the bed is reserved only for sleep; any other activity only serves to associate the bed with the habit of staying awake.

Rule 3 : Set your alarm and get up at the same time every morning, regardless of how much sleep you got during the night.

Rule 4 : Do not nap during the day.

Both of these rules help the patient gradually re-establish a regular pattern of sleeping and waking. Using weekend mornings to sleep longer than one hour should be discouraged.

The patient should make a commitment to get up every morning at the same designated time.

Most sleep researchers are convinced that naps interfere with the body's regular sleep/wake rhythm.

Rule 5 : Do not drink alcohol within several hours of bedtime.

Alcohol, depending on the quantity and timing, may initially provoke sleep; however, it leads to restless, nonrestorative sleep and in general a decrease in total sleep time.

Rule 6 : Do not consume caffeine beverages or medications that contain caffeine within several hours of bedtime.

Caffeine is a long-lasting stimulating drug which increases wakefulness during the night.

Rule 7 : Do not smoke within several hours of bedtime.

Just like caffeine, nicotine is a powerful stimulant and research has shown that people who smoke on a regular basis sleep poorly.

Rule 8 : Exercise in the late afternoon or early evening.

Light stretching or a short walk may be sufficient. Too much physical activity late in the evening, rather than preparing the body for sleep, is stimulating. In fact it has the paradoxical effect of waking us up. Nevertheless, moderate exercise in the early evening helps in maintaining our alertness.

Rule 9 : Allow yourself a transition period. During the hour before you go to bed, gradually decrease your activity level. Do things that are quiet and relaxing.

Presleep activities often include some kind of relaxation exercise (e.g. progressive relaxation). This is a time to prepare for sleep by letting go of any excess tension or stress.

Rule 10: Develop a routine before going to bed. Include activities like personal hygiene, checking lights, and locked doors. Do things that make you feel safe and secure.

Participating in these activities establishes the that it is time to go to sleep.

Rule 11: Make sure no excessive light or sound will disturb you, and that your room is at a comfortable temperature.

Studies demonstrate that noisy environments and high temperatures (above 24°C) disturbs sleep in people; they awaken more and deep sleep cycles are decreased.

Rule 12: Going to bed hungry or after a large meal can inhibit sleep. However, if you feel hungry, a light snack or a glass of warm milk is appropriate.

Snacks should not be taken in the middle of the night in order to avoid waking in the middle of the night for food.

After explanation, the stimulus control instructions are handed out to the patient (see Appendix G). The patient is asked to follow very carefully all the instructions for the next four weeks. In the beginning, this might be difficult for some people. For example, patients with a major depression are often unable to tolerate the initial sleep loss. It is recommended that the health care worker explains to the patient how difficult it will be for them to follow the instructions. In fact patients should expect their sleep to get worse the first week.

Instruction 1: Go to bed only when you are actually sleepy.

Instruction 2: Do not use your bed for anything but sleep. Do not read, watch television, talk on the telephone, eat, or worry in bed. The only exception to this rule is sexual relations.

The purpose of these two rules is to strengthen the association between the bed and falling asleep rapidly. For many people suffering from insomnia, the bed becomes a cue for

activities other then sleep. Initially, they often indulged in activities that were incompatible with sleep such as eating, reading or worrying.

In time, this habit became associated with the bed and finally the bed became a signal to stay awake. This explains why some people who suffer from insomnia can easily fall asleep when they are in a different environnment. For example, a poor sleeper might fall asleep much easier in a chair in the living room or in a hotel.

Instruction 3: If you find yourself unable to fall asleep within a reasonable period of time (15 minutes), get up and go into another room. Engage in some quiet activity until you begin to feel sleepy and then return to the bedroom to sleep.

It should be impressed on the patient that good sleepers fall asleep between 10 and 15 minutes. It should be stated that in the beginning, patients will find themselves getting up many times during the night before falling asleep.

Instruction 4: If you still cannot fall asleep within a brief time, repeat step 3. Do this as often as necessary throughout the night. You may use this same step if you awaken in the middle of the night and do not fall asleep within about 10 minutes.

In the first week many patients will be discouraged, feel that the cure is worse then the problem that they originally had, and experience fatigue during the day. It is important to stress that this state is only temporary and that by continuing to practice, the negative effects will occur less and less as sleep becomes more normal and refreshing.

Instruction 5: Set the alarm for the same time every morning and get up when it rings, no matter how much sleep you got during the night or how tired you may be.

Instruction 6: Do not take naps during the day. Steps 5 and 6 will help your body in developing a consistent natural sleep rhythm.

It should be explained that by getting up at the same time each day and not taking naps, the patient will develop a regular and sounder sleep.

Final sessions

The main aims of the subsequent sessions are:

1. To review compliance to the sleep hygiene rules and stimulus control instructions.
2. To control adherence to filling out the self-monitoring diaries.
3. To further consolidate the behaviour changes being made by the patient.
4. To introduce a relaxation technique that would enhance the ability to fall asleep quickly.
5. To reinforce progress.
6. To encourage commitment to the four-week treatment period.

References

Bootzin, R.R. Stimulus control treatment for insomnia. Proceedings of the 80th Annual Convention of the American Psychological Association, 1972, 7, 395-396.

Bootzin, R.R. Effects of self-control procedures for insomnia. In R.B. Stuart (Ed.), Behavioral self- management: Strategies and outcomes. New York: Brunner/Mazel, 1977.

Bootzin, R.R. & Engle-Friedman, M. The assessment of insomnia. Behavioral Assessment, 1981, 3, 107-126.

Borbély, A. Schlafgewohnheiten, Schlafqualität und Schlafmittelkonsum der Schweizer Bevölkerung. Bulletin des médecins suisses, 1984, Band 65, Heft 34.

Borkovec, T.D. & Fowles, D.C. Controlled investigation of the effects of progressive and hypnotic relaxation on insomnia. Journal of Abnormal Psychology, 1973, 82, 153-158.

Coursey, R.D., Buchsbaum., M., & Frankel, B.L. Personality measures and evoked responses in chronic insomniacs. Journal of Abnormal Psychology, 1975, 84, 239-250.

Dement, W.C. & Guilleminault, C. Sleep disorders: The state of the art. Hospital Practice, 1973, 8, 57-71.

Edelman, R. Effects of progressive relaxation on autonomic processes. Journal of Clinical Psychology, 1970, 26, 421-425.

Freedman, R., & Papsdorf, J. Biofeedback and progressive relaxation treatment of insomnia: A controlled, all-night investigation. Biofeedback and Self-Regulation, 1976, 1, 253-271.

Fry, A. Hypnosis in the treatment of insomnia. Medical World, 1963, 99, 194-199.

Guilleminault, C., Eldridge, F.L., & Dement, W.C. Insomniacs with sleep apnea: a new syndrome. Science, 1973, 181, 856-858.

Hanley, F.W., Modern hypnotherapy. Applied Therapeutics, 1965, 7, 625-628.

Hammond, E.C. Some preliminary findings on physical complaints from a prospective study of 1,064,004 men and women. American Journal of Public Health, 1964, 54, 11-23.

Haynes, S.N., Follingstad, D., & McGowan, W. Insomnia: Sleep patterns and anxiety level. Journal of Psychosomatic Research, 1974, 18, 69-74.

Haynes, S.N., Price, M.G., & Simons, J.B. Stimulus control treatment of insomnia. Journal of Behavior Therapy and Experimental Psychiatry, 1975, 6, 279-282.

Hauri, P. Psychology of sleep disorders. Their diagnosis and treatment. Paper presented at the Sympposium on Sleep and dreams of the 83rd Annual Convention of the American Psychological Association, Chicago, 1975.

Jacobson, E. Anxiety and Tension Control. Lippincott, Philadelphia, Pennsylvania, 1964.

Johns, M.W. Management of insomnia, Drugs, 1972, 4, 290-294.

Johnson L.C., Burdick J.A., Smith J. Sleep during alcohol intake and withdrawal in the chronic alcoholic. Archives of General Psychiatry, 1970, 22, 406-418.

Johnson, D., & Spielberger, C. The effects of relaxation training and the passage of time on measures of state and trait anxiety. Journalk of Clinical Psychology, 1968, 24, 20-23.

Kay, D.C., Blackburn, A.B., Buckingham, J.A., et al: Human pharmacology of sleep, In Williams, R.L., Karacan, I. (eds): Pharmacology of Sleep. New York, Wiley, 1976.

Karacan I. & Williams R.L. Insomnia: Old wine in a new bottle, Psychiatric Quarterly, 1971, 45, 274-288.

Kales, A., Allen, W.C., Scharf, M.B., & Kales, J.D. Hypnotic drugs and their effectiveness: All-night EEG studies of insomniac subjects. Archives of General Psychiatry, 1970, 23, 226-232.

Kales, A., Kales, J.D., Bixler, E.O., & Scharf, M.B. Methodology of sleep laboratory drug evaluations: Further considerations. In F. Kagan, T., Harwood, R., Rickels, A.D., Rudzik, & H. Sorer (Eds.), Hypnotics: Methods of development and evaluation. New York: Spectrum, 1975.

Kales, A., Bixler, E.O., Leo, I.A., Hearly, S., & Slye, E. Incidence of insomnia in the Los Angeles metropolitan area Sleep Research, 1974, 4, 139.

Kales, A., & Kales, J. Recent advances in the diagnosis and treatment of sleep disorders. In G. Usdin (Ed.), Sleep research and clinical practice. New York, Brunner/Mazel, 59-94, 1973.

Kales, A., & Kales, J.D. Evaluation and Treatment of Insomnia. Oxford, University Press, 1984.

Lawrence, P.S., & Tokarz, T. A comparison of relaxation training and stimulus control. Paper presented at Association for the Advancement of Behavior Therapy. New York, 1976.

Marks, I: Anxiety disorders, In Greist, J.H., Jefferson J.W., Spitzer R.L. (eds.): Treatment of Mental Disorders. New York, Oxford University Press, 234-265, 1982.

Mello, N.K., Mendelson, J.H. Behavioral studies of sleep patterns in alcoholics during intoxication and withdrawal. Journal of Pharmacological Experimental Therapy, 1970, 175, 94-112.

Montgomery, I., Perkin, G., & Wise, D. A review of behavioral treatments for insomnia. Journal of Behavior Therapy & Experimental Psychiatry, 1975, 6, 93-100.

Monroe, L.J. Psychological and physiological differences between good sleepers and poor sleepers. Journal of Abnormal Psychology, 1967, 72, 255-264.

Nicassio, P., & Bootzin, R. A comparison of progressive relaxation and autogenic training as treatments for insomnia. Journal of Abnormal Psychology, 1974, 83, 252-260.

Nicassio, P., & Boyan, M., & McCabe, T. Progressive relaxation. EMG biofeedback, and biofeedback placebo in the treatment of insomnia. Paper presented at the XVI meeting of the InterAmerican Society of Psychology, Miami, 1976.

Oswald, I. Drugs and sleep. Pharmacological Review, 1968, 20, 272-303.

Raskin, M., Johnson, G., & Rondesvedt, J. Chronic anxiety treated by biofeedback-induced muscle relaxation. Archives of General Psychology, 1973, 28, 263-267.

Rundell O.H., Lester B.K., Griffiths W.J., Williams H.L. Alcohol and sleep in young adults. Psychopharmacologia, 1972, 26, 201-218.

Schultz, J.H., & Luthe, W., Autogenic training. New York: Grune and Stratton, 1959.

Selected Symptoms of Psychological Distress. Rockville MD, US Departement of HEW, 1970.

Steinmark, S. & Borkovec, T. Active and placebo treatment effects on moderate insomnia under counterdemand and positive demand instructions. Journal of abnormal Psychology, 1974, 83, 157-163.

Turner, R.M., & Ascher, L.M. Controlled comparison of progressive relaxation, stimulus control, and paradoxical intention therapies for insomnia. Journal of Consulting and Clinical Psychology, 1979, 47, 500-508.

Webb, W.B. Sleep: The gentle tyrant. Englewood Cliffs, New Jersey, Spectrum, 1975.

Zwart, C.A., & Lisman, S.A. Analysis of stimulus control treatment of sleep-onset insomnia. Journal of Consulting and Clinical Psychology, 1979, 47, 113-118.

Appendix A

Principal Causes of Insomnia

Physical causes

Uneasiness - discomfort

- **Dynspnoea, cough**
- **Itching**
- **Nocturia**
- **Parkinson's syndrome**
- **Restless legs syndrome**

Chronic pains

- **Headaches**
- **Neuralgia**
- **Cramps, colic**
- **Rheumatism**
- **Cancer**

Endocrine disorders

- **Menopause**
- **Hyperthyroidism**
- **Hypoglycaemia**

Psycho-organic syndromes

- **Drugs or substance withdrawal**
- **Encephalopathies**
- **Dementia**

Mental causes

Psychiatric disorders

- **Depression**
- **Anxiety**
- **Obsessive compulsive disorder**
- **Schizophrenia**
- **Hypomania**
- **Anorexia nervosa**
- **Chronic alcoholism**
- **Drug addiction**

Psychosocial occurrences

Crises (recent or imminent)

- **Separation, divorce**
- **Overwork, career changes**
- **Traumatic experiences (accident, assault)**
- **Changes surroundings,immigration**
- **Serious illness in family**
- **Birth in the family**

Losses (real or symbolic)

- **Death of spouse or close relative**
- **Financial loss**
- **Acquiring a physical handicap**
- **Son or daughter leaving home**
- **Retirement**
- **Failure**

Behavioural causes

Lifestyle

- **Naps (during the day)**
- **Late stimulating activities (physical exercise)**
- **Irregular sleeping hours**
- **Alcohol or tobacco abuse**
- **Excessive caffeine in the evening**
- **Disturbing bed partner**
- **Disturbing environment (heat,cold noise)**

State of mind

- **Conditioned insomnia (linking sleep to unpleasant experiences)**
- **Trying too hard to get to sleep**

Drug-related causes

- **Anorexigenics**
- **Stimulant antidepressants**
- **Thyroid hormones**
- **Sympathomimetics**
- **Diuretics**
- **Corticosteroids**
- **Beta-blockers**
- **Reserpine**
- **Hypnotics (improper use)**

Appendix B

Assessment Diary Instructions

The rationale for the use of self-monitoring should be carefully explained to the patient. It should be stressed that these records are a part of the therapeutic process, pointing out that (a) by recording sleep and other behaviours, patients have an objective means of describing their sleep/wake patterns, (b) both patient and therapist can better know which behaviours should be addressed, and (c) patients who continue to monitor their behaviour tend to progress better than patients who do not. Following this, the method of collecting data should be gone over carefully for the following diaries and log.

Appendix C

Pre-Sleep Insomnia Assessment Diary

(To be filled out at night)

NAME ----------

WEEK _____

FUNCTIONING DURING THE DAY	Use the letters from A to E which best describes your state of functioning during the day with "A" = "normal"; "E" = "difficulty concentrating".
NAPS	How many, when, where and how long?
DINNER TIME	Indicate the time of your last big meal.
CAFFEINE/ALCOHOL	List any drinks consumed within the last 5 hours.
MEDICATION	Write down any hypnotics or other drugs taken within the last 5 hours.
PRE-BED ACTIVITIES	What activities were you involved with during the evening and just before going to bed.
SLEEPY BEFORE GOING TO BED	Did you feel either drowsy, sleepy or tired before deciding to go to bed.
IN BED ACTIVITIES	What activities were you involved with while lying in bed (e.g. watching television or reading).

DATE	DAY	FUNCTIONING DURING THE DAY: A. Normal B. Fatigued C. Sleepy D. Irritable E. Difficulty concentrating	NAPS	DINNER TIME	CAFFEINE ALCOHOL	MEDICATION	PRE-BED ACTIVITIES	SLEEPY BEFORE GOING TO BED	IN BED ACTIVITIES
EXAMPLE									

Appendix D

Post-Sleep Insomnia Assessment Diary

(To be filled out in the morning)

NAME _____ WEEK _____

LIGHTS OUT — Time when you first tried to fall asleep.

MINUTES TO FALL ASLEEP — Approximately how many minutes did it take you to fall asleep?

TIMES UP DURING THE NIGHT — Record how many times did you awaken during the night.

TOTAL ESTIMATE OF TIMES UP — Approximately how many minutes in total were you awake during the night.

FINAL WAKING TIME — When you are awake and do not fall asleep again.

OUT OF BED TIME — What time did you get out of bed?

TOTAL HOURS SLEPT — How much sleep did you get during the night? (Exclude naps and awakenings during the night)

TYPE OF SLEEP — Use the numbers from 1 to 5 to describe how sound or restless your sleep was.

STATE AT WAKEFULNESS — Refers to how you feel upon awakening.

DATE	DAY	LIGHTS OUT	MINUTES TO FALL ASLEEP	TIMES UP DURING THE NIGHT	TOTAL ESTIMATE (IN MINUTES) OF TIMES UP	FINAL WAKING TIME	OUT OF BED TIME	TOTAL HOURS SLEPT	TYPE OF SLEEP: 1. very restless 2. poor 3. average 4. good 5. very sound	STATE OF WAKEFULNESS: 1. extremely fatigued 2. fatigued 3. average 4. rested 5. well rested
EXAMPLE										

Appendix E

Insomnia Sleep Log

The Insomnia Sleep Log may be used to replace the Post-Sleep Insomnia

Date	Day	Hours	21	22	23	24	1	2	3	4	5	6	7	8	9
Example		Out of bed													
		Woke up													
		Fell Asleep													
		Out of bed													
		Woke up													
		Fell Asleep													
		Out of bed													
		Woke up													
		Fell Asleep													
		Out of bed													
		Woke up													
		Fell Asleep													
		Out of bed													
		Woke up													
		Fell Asleep													

Appendix F

12 Rules for Healthy Sleep

1. Lie down intending to go to sleep only when you are sleepy. But have a consistent time when you plan to go to sleep.

2. Never use the bedroom for anything but sleep or sex. No activities in bed like reading, watching television, eating, talking on the telephone or discussing problems.

3. Set your alarm and get up at the same time every morning, regardless of how much sleep you got during the night.

4. Do not nap during the day.

5. Do not drink alcohol within several hours of bedtime.

6. Do not consume caffeine beverages or medications that contain caffeine within several hours of bedtime.

7. Do not smoke within several hours of bedtime.

8. Exercise in the late afternoon or early evening. Light stretching or a short walk may be sufficient.

9. Allow yourself a transition period. During the hour before you go to bed, gradually decrease your activity level. Do things that are quiet and relaxing.

10. Develop a routine before going to bed. Include activities like personal hygiene, checking lights, and locked doors. Do things that make you feel safe and secure.

11. Make sure no excessive light or sound will disturb you, and that your room is at a comfortable temperature.

12. Going to bed hungry or after a large meal can inhibit sleep. However, if you feel hungry, a light snack or a glass of warm milk is appropriate.

Appendix G

Stimulus Control Instructions

1. Go to bed only when you are actually sleepy.

2. Do not use your bed for anything but sleep. Do not read, watch television, talk on the telephone, eat, or worry in bed. The only exception to this rule is sexual relations.

3. If you find yourself unable to fall asleep within a reasonable period of time (15 minutes), get up and go into another room. Engage in some quiet activity until you begin to feel sleepy and then return to the bedroom to sleep.

4. If you still cannot fall asleep within a brief time, repeat step 3. Do this as often as necessary throughout the night. You may use this same step if you awaken in the middle of the night and do not fall asleep within about 10 minutes.

5. Set the alarm for the same time every morning and get up when it rings, no matter how much sleep you got during the night or how tired you may be.

6. Do not take naps during the day. Steps 5 and 6 will help your body in developing a consistent natural sleep rhythm.