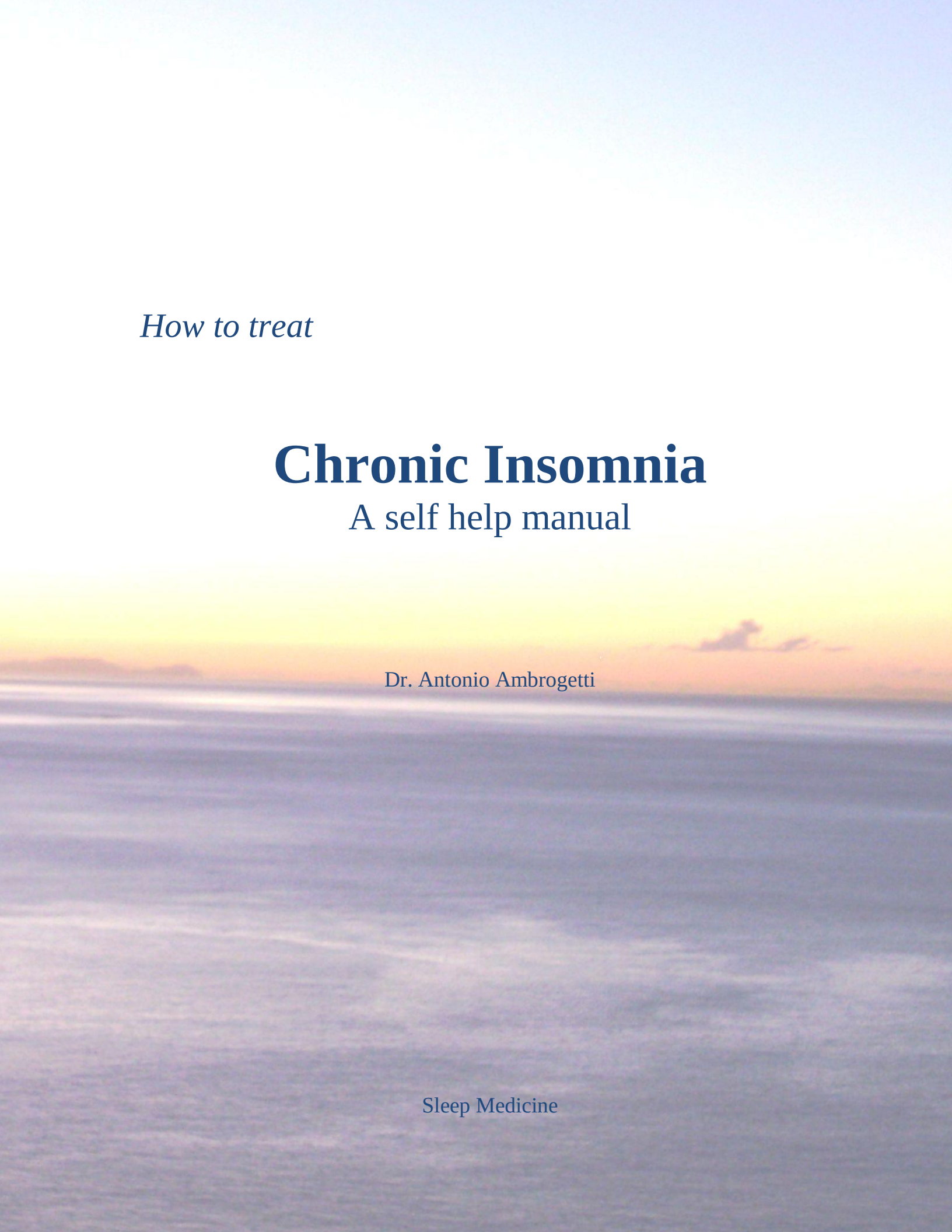

How to treat

Chronic Insomnia

A self help manual

Dr. Antonio Ambrogetti

Sleep Medicine

How to treat

Chronic Insomnia

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Contents

Preface

The purpose of this book is to provide a management frame work that any person can use for treating chronic insomnia successfully.

It is based on clinical experience; that is on practical interaction with patients and focusing on what to do and how to do it.

I recommend that you read this book (a short one) from the beginning to the end and then go back to the part(s) that apply more specifically to you.

The first chapter 'Need to know' is very important and it lays the foundation for successful management. The second chapter outlines the principles of chronic insomnia management. The third chapter describes examples of common causes of insomnia. Although some of the cases may not apply directly to you, nevertheless they will help you understand the nature of the problem. In some cases cooperation with a health practitioner, a sleep physician, a psychologist and a counsellor is needed.

The book contains some unavoidable repetitions of some ideas and treatment recommendations, which however will help highlight important facts about chronic insomnia.

Ultimately after reading this book it is my hope that you will be able to look at chronic insomnia in a different way and that you have picked up useful suggestions to improve your sleep quality and your daytime function.

A. AMBROGETTI

Introduction

What is insomnia.

Insomnia is a symptom consisting of difficulty initiating sleep, maintaining sleep and/or waking too early in the morning. Insomnia is perceived to be causing daytime symptoms such as irritability, tension, helplessness, feeling unhappy, low in energy, and a reduction of interest in usual activities. The person may complain of poor concentration, lethargy, or may be feeling uncoordinated and not functioning as they would like to be. This can lead to worrying about one's health, increased risk of infection and poor health in general.

Insomnia therefore does not just affect bedtime and night time but has an important daytime component. It is the combination of both the difficulty with sleep and the poor daytime function that constitutes insomnia as an important symptom. Seen in this context insomnia is a highly subjective feeling. It is a very common problem, which affects one in 10 of the population and, in a severe manner, at least 5% (one in 20).

Insomnia = difficulty sleeping *and* poor daytime function

In some cases insomnia is of brief duration, perhaps up to a month or so and is usually triggered by well recognized factors such as an important event in life. In most people eventually the difficulty with sleep subsides and daytime function resumes. In other people however, the poor sleep quality and the poor daytime function persists well beyond a few months and this is what we refer to as chronic insomnia. Insomnia can be continuous and be experienced most nights of the week, in other cases insomnia can be intermittent, sometimes with seasonal variability.

This book is predominantly concerned with chronic insomnia even though some of the principles outlined in the next few chapters can be applied successfully to insomnia of shorter duration.

Please refer to the glossary in the Appendices for an explanation of terms/words.

Chapter 1

NEED TO KNOW

In order to treat insomnia successfully there are some ideas and principles that need to be understood as they are the basis for successful treatment.

The following points are important to understand.

How much sleep a person needs.

People frequently ask this question. The answer is each individual has different needs. It is often quoted that on average we need between 7½-8 hours of sleep. In reality the amount of sleep that the person needs changes during their lifetime. For example teenagers due to hormonal and maturation factors often need longer hours than adults. It would not be uncommon for a teenager to need at least 9 hours sleep compared to an older or younger person who may need a slightly less amount of time. However, even in adulthood the amount of sleep needed can vary from 5 hours (short sleepers) and 9 hours or more (long sleepers).

If you want to know how much sleep you need you should have available a week or 10 days where you are allowed to go to bed when sleepy and get up when you are ready without any commitments or stress which may interfere with sleep (perhaps on holiday from work). If you are able to have that amount of time you can record bedtime and wake up time each day and then average the number of hours slept over the period. That will tell you how much sleep your body needs if left to its own devices, which answers the question "how much sleep do I need?"

Insomnia as a symptom not a disease.

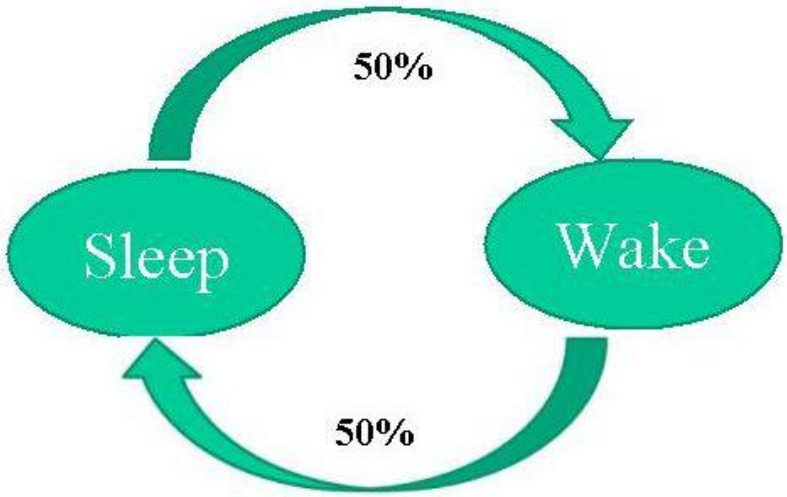
There is some debate among people involved with sleep medicine of whether insomnia should be regarded as a symptom or a disease. Everybody agrees that insomnia is a symptom. However, some health professionals would also argue that once insomnia has been going on for a long time it could potentially be regarded as a disease. For the

purpose of our discussion and throughout this book it is important that insomnia is seen as a symptom not as a disease. We usually say that we *treat* symptoms and we *cure* diseases. There are many conditions in medicine where symptoms are treated without necessarily curing the disease. For example the headache (*a symptom)* in migraine *(a disease)* can be treated but usually migraine is unlikely to be cured.

Looking at insomnia as a symptom is useful because as we will see in the next few pages there are many causes for insomnia and often it is useful to identify what triggers the symptom of insomnia and what makes it persist over time.

Insomnia is a symptom of poor function during the 24 hours not just a bedtime or night time problem.

This is a very important idea to be understood. For cultural reasons often people say '*If I could have a good night's sleep I would not be feeling so tired during the day'* or '*If I could have a good night's sleep I would be able to do certain things which I am not able to do during the day'*. This is to some degree correct. However, this is only part of the story, and no more than 50% of the problem.



The other part of the story can be described as '*If you have a good day you will have a good night's sleep'*. This is to say that often what we have done between 8am-8pm is as relevant to sleep as night time is relevant to daytime function.

From a practical point of view it is very useful to consider insomnia a symptom of poor function within the 24 hours whereby daytime influences bedtime and sleep time and bed time influences daytime. As you will see in the next chapter what the person does and what the person feels during the day is important to be addressed in order to successfully treat insomnia.

People with insomnia who are sleepy during the day and people with insomnia who are not sleepy.

When people feel they are not sleeping well at night (difficulty initiating sleep, staying asleep and waking up early) an important question to ask is how sleepy they feel during the day. Often the person complains of insomnia, feels tired but does not fall asleep during the day. In other situations the person suffers from insomnia and tends to fall asleep very easily during the day. These are two completely different groups of people although both suffering from insomnia. People, who suffer from insomnia and fall asleep easily during the day, often have some specific disturbances of sleep during the night (see examples in table 1).

Table 1. Some examples of conditions causing insomnia *and* daytime sleepiness

Obstructive sleep apnea
Restless legs syndrome
Abnormal movement in sleep
Depression
Heartburn and oesophageal reflux
Chronic pain
Bladder problems
Coffee, alcohol in excess

On the contrary, people with insomnia who do not fall asleep easily during the day are people who tend to be ***hyper-aroused***.

We are hyper-aroused when our stress system is continuously activated. As human beings we only have one stress system, which is activated irrespective if we are under a physical or mental threat. The stress system is very useful for survival. It involves activation of hormones such as adrenaline, nor-adrenaline and cortisone. These hormones allow us to have an emergency response such as the flight or fight response, which helps us under threatening conditions. The body, however, does not make a distinction between a physical threat and a mental threat. If something is in our minds and upsetting us for whatever reason the stress system is activated and the body is not in a state conducive to sleep. If the stress system is activated for a limited period of time it is very important to our defense response. However, if *constantly activated*, it is detrimental to our health, as it leads to physical exhaustion. Hyper-arousal is a common reason why insomnia persists over time. Some people tend to be more likely to have their stress system activated as part of their genetic make up. Some individuals may not be able to fall asleep if they hear a noise in the middle of the night and they have to go and check it out. Other people instead are able to turn around and go back to sleep. Both are within normal limits but the first type, who is unable to fall asleep if there is a noise in the house, tends to be *hyper-alert*, meaning that his alert system tends to be more responsive and more likely to keep them awake compared to the second type of person.

In this society there are many circumstances that cause our stress system to be

continuously activated due to personal and relationship problems, emotional issues, the work environment, family concerns and so forth.

Psycho-physiological 'insomnia' (learned insomnia).

This is a common mechanism and state of health, which sets in once the symptom of insomnia has been present for a few weeks or months. No matter how the problem started, psycho-physiological insomnia sets in. This refers to the situation where after a few weeks or months of not being able to sleep, but having to continue our daily duties (family, work commitments) the person starts longing more and more to finally get a good night's sleep. The more the longing and desire to have a good night's sleep the more the anxiety and the expectation to fall asleep increases and the person is less and less able to fall asleep. After a while going to bed, bedtime and often the bedroom itself become negatively associated with falling asleep and the person becomes more and more anxious around bedtime with the expectation that once again he will not be able to fall asleep. This negative state of affairs is what we refer to as psycho physiological insomnia. It appears that despite any effort, falling asleep cannot be achieved. Therefore the person has a feeling of having lost sense of control over his ability to fall asleep. Learned insomnia sets in irrespective of how the insomnia started once the problem has been going on for some time. It is one of the main reasons that perpetuate insomnia and it is one of the targets of our treatment.

Individual body clock.

Each individual has a different body clock. The body clock is what regulates our sleep and wake pattern in synchrony with the light and night cycling due to the earth rotation. We identify approximately 3 types of body clocks. The *morning type* body clock are people who tend to go to sleep early in the evening, perhaps about 9-10pm and by 6am it is difficult to keep them in bed. The *evening type* are people who tend to fall asleep preferably between 11pm-midnight and if left undisturbed in the morning they tend to sleep in until 8am and are somewhat sluggish in getting up. There is an *intermediate type* in between these two types. The kind of body clock the person has can influence the symptom of insomnia. The questionnaire in appendix 00 is a simple way to assess body clock types. Keep in mind that work schedules, in particular shift work, and medications used for other medical problems can affect our body clock.

In summary the following ideas are very important to be understood in order to properly manage the symptom of insomnia.

A different understanding of sleep.

Until recently sleep and wake have been thought to be regulated by a simple switch system located somewhere in the brain. At a certain time in the evening the switch is turned off and we fall asleep. In the morning it is switched back on and we wake up Fig 1

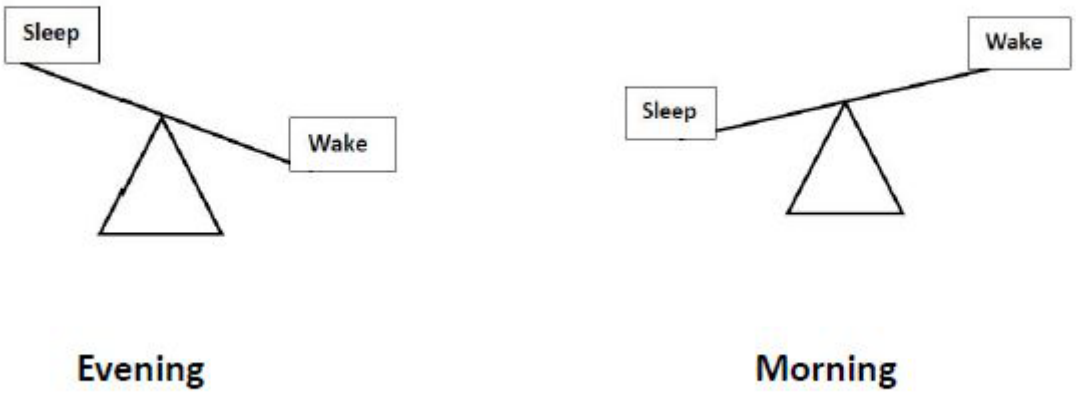


Fig 1

However recent studies of people sleeping in a brain scanner have shown a completely different and more complex picture. While we are asleep there are multiple switches not just one. For example there is a "*consciousness*" switch, a "*thinking*" switch, and "*memory*" and "*emotion*" switches and others. To obtain a good night sleep it is likely that all the switches need to be in synchrony (fig 2)

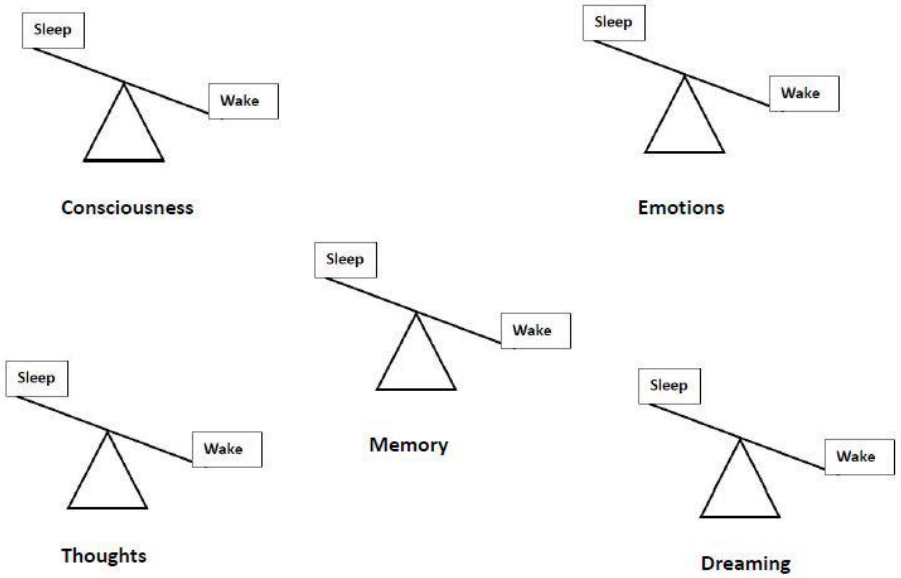


Fig 2

If all these areas of the brain are not in tune it is likely that we perceive poor sleep quality and un-refreshing sleep Fig 3

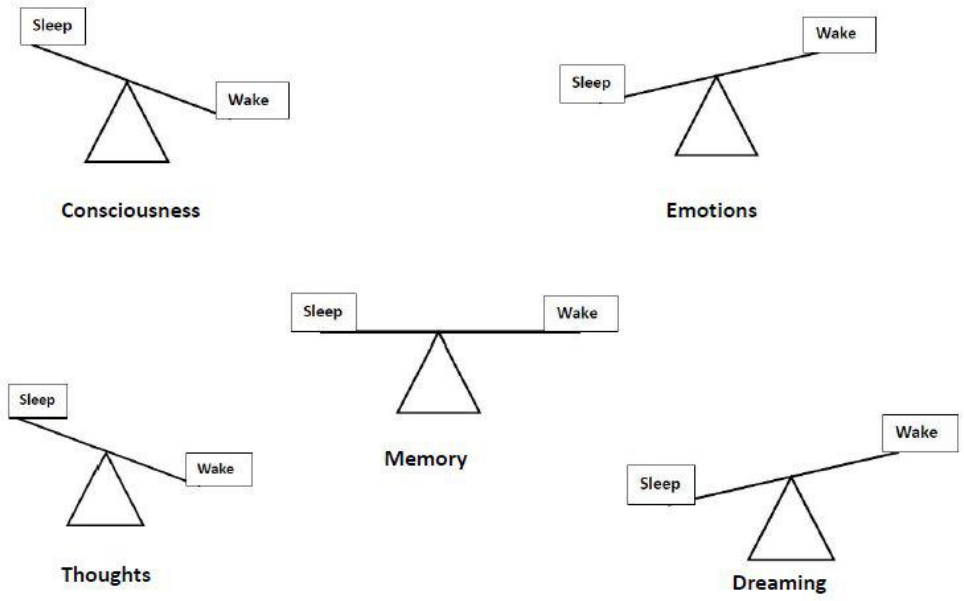


Fig 3

In summary:

1. The amount of sleep needed is different in each person.
2. Insomnia is a symptom not a disease.
3. Insomnia is a symptom of poor function in the total 24 hour period not just a bedtime and night time problem.
4. Insomnia is different in people who are very sleepy during the day and people who are not sleepy during the day.
5. Psycho-physiological insomnia is a common reason why insomnia becomes chronic.
6. Different individuals have different types of body clocks and problems with the body clock can cause insomnia.

The interaction of the above factors explains why insomnia is different in different people and it is a highly subjective experience.

CHAPTER 2

Insomnia: Assessment and Management

Start your self-assessment looking into what kind of body clock you have, early to bed, late to bed or in between) by filling the questionnaire (Appendix). Another questionnaire DASS (depression, anxiety, stress score, see Appendix) is also useful in self-assessment of possible symptoms of anxiety, stress or depression.

Assessment

Specific Questions.

It is useful to write down the answers to the following questions to clarify the nature of your sleep problem.

How much of the problem is initiating sleep, maintaining sleep, waking up too early, or a combination of all three.

How long has insomnia been a problem for?

Did it start suddenly or gradually? Is there a seasonal variation?

Is it a continuous or intermittent problem?

Do you recognize any triggers at the beginning of the insomnia or perhaps even more recently?

If insomnia has been present for months or years, what makes you look into it *now*? (That is, is it something new happened recently?)

What treatment have you used in the past and what were the benefits if any?

As you explore these details you start defining the problem more precisely. For example, the complaint may be of difficulty falling asleep, but once asleep the person sleeps well if left undisturbed. This scenario is strongly suggestive of a circadian rhythm problem (a body clock disturbance), such as delayed sleep phase (see case 00, page 00). You may describe waking up at 3-3.30am and not being able to fall asleep again, but just dozing on and off until the alarm goes off. This suggests that depression or anxiety or both may be contributing to insomnia. A person in his 50's, who has had insomnia for as long as he can remember, sets a scenario potentially more difficult to manage than someone who

had insomnia for 18 months following a divorce or a death in the family. In the former the details of events and emotions going back to childhood and the teenage years may need to be explored(family dynamics, school environment, early relationship and so forth).

Daytime Function

This part of the person's history usually requires prompting. Although you may feel tired during the day, it is important to clarify further:

What is it that you can't do during the day?
Does it affect your work and how?
Does it affect your family life, and in what way?

It is important to be specific because it is common for the person to be able to attend to most of their duties proficiently even though they have *"difficulty and feel tired"*.

What do you mean for tiredness?

Clarify what you mean for tiredness. Tiredness and fatigue are used frequently and interchangeably. Tiredness (or fatigue) is a highly subjective sensation, but most people recognize three kinds of tiredness:

Lack of energy tired. The sensation the person has after a long day of physical activity, when the muscles do not want to move any more.

Sleepy tired (lethargy).This is the sensation of wanting to close your eyes and fall asleep.

"Could not be bothered" kind of being tired. This is the sensation of not having the motivation, the "up and going" kind of feeling.

Ask yourself which description of tiredness is more close to your sensation if you only have one possible option. The distinction is important because the "could not bother" sensation and the lack of energy tiredness are less likely to be related to a primary sleep disorder (such as snoring and obstructive sleep apnea, restless leg syndrome or narcolepsy).

The next question is linked to the previous one:

Do you fall asleep during the day?

This question is very important (see page 00) as people who have insomnia and are very sleep during the day have different problems than the ones who may need to lie down but can't fall asleep.

The fact that the person has insomnia (cannot sleep at night) and does *not* fall asleep easily during the day, conveys immediately 3 important pieces of clinical information:

1. The person is probably sleeping longer at night than they think they are; enough sleep is obtained to fulfil the body needs despite the complaint of insomnia (this can eventually be objectively measured by a sleep study).

2. A state of hyper arousal is likely present.

3. The tiredness the person is complaining about is not likely to be sleepiness but rather lack of energy (anergy) or lack of drive, lack of motivation or a combination of both.

Hyper-arousal.

Hyper arousal is due to an increase in the level of the stress hormones (cortisone and adrenalin) in the body. When these hormones are high we can't sleep. Note that the cortisone is also high at night in people who suffer from depression. This observation is relevant because it explains why people with depression often suffer from insomnia.

Assessing your emotions

The aim is to give the opportunity to think about the personal feelings:

1. You can use a self-administered questionnaire such as the Kessler Psychological Distress Scale (K10 for short, Appendix) or equivalent as a way of exploring your feelings. For example if the probability of distress is high you may ask yourself "What might be the association with anxiety? What events in the past or recent present may have triggered it?"
   Another questionnaire that may point to psychological symptom is the DASS (Depression, Anxiety, and Stress Scale) which need to be administered by a health professional.

2. If you cannot switch off at night and you are hyper-aroused you may ask "Is there any reason for being stressed?"

If you find it difficult to explore facts, emotions and relationships of past experiences, then health professional (a counsellor) may be of help in exploring issues such as relation to your parents, siblings and friends in the early years at school. Such issues are frequent concomitants to insomnia.

Where were you born? How many siblings in your family?

How was your upbringing? How was the school environment?

Sometime in recalling such events you may become sad or teary, which indicates the presence of a long standing emotional issue, likely relevant to your sense of well-being and to insomnia.

Treatment strategies.

Often the person with chronic insomnia has invariably tried multiple remedies from conventional to alternative medicine with temporary or no success and has the feeling of having "l*ost control over their sleep."* .

The aim of our treatment is to restore control over your sleep. The amount of work will vary from one person to another.

Management involved four broad areas:

1. Management of primary sleep disorders if present including potential side effects of medications and other medical or psychiatric co-existing problems.

2. Re-framing the problem of insomnia.

3. Management of daytime issues.

4. Management of bedtime and night time problems.

Do you have any of the following:

These are common conditions that can cause insomnia by fragmenting sleep.

Obstructive sleep apnea. (page 00).
Restless leg and leg movements
Body clock problems (page 00,00)
Medications you using (page 00)
Excessive caffeinated beverages (page 00)

Re-framing the problem of insomnia.

The following is a simple way to proceed and can be modified if necessary.

Remember the following points:

1. Insomnia is a symptom not a disease (see also chapter 00)

2. Insomnia is a symptom of 24 hour poor functioning, not just a bedtime/night time problem (fig 00). What the person does from 8.00am until 8.00pm is important to sleep as sleep is important to daytime function. What matters during the day is self, family and work environment relationships (see below).

3. Understand the notion of "learned insomnia" (psycho-physiological insomnia, see page 00).

4. Be aware of insomnia with daytime sleepiness versus insomnia without daytime sleepiness and establish which group you belong to.

Daytime issues.

The way we function during the day is very important in order to have a good night's sleep. Three main areas are relevant:

Self
Family/close friends
Working and social environment

Often the reason why we sleep poorly is found in events that occur during the day. Sometimes we are able to recognize precisely the day and even the time when difficulty initiating and maintaining sleep started. Other times it is more difficult. Insomnia seems to have started gradually over many months or years before the person seeks help.

It is important to think about events that may have triggered the symptom of insomnia. Typical cases to consider are death in the family, personal events such as separation or divorce, a change in job or career. A change in the working environment itself may have lead to an increased level of anxiety or stress which in turn leads to poor sleep. Poor sleep causes poor day functioning in what becomes a vicious circle.

Sometimes we feel that we have 'come to terms' with the stressful events. However, the emotional cost can take weeks, sometimes months to reveal itself and the only main manifestation of these unresolved feelings is often insomnia and a general un-wellness during the day.

Self and Family

Try to answer this question: do I feel "happy"? At the end of the day either at work or at home do we have a sense of fulfilment and satisfaction?
If this is missing try to explore the underlying reasons. Of course the most important issues are intimate relationships with our family, spouse, our children and our close friends. If there is any problem it is likely that it reflects at nighttime with difficulty with sleep and insomnia.

This is particularly the case when the person has to make a decision but is unable to make a final choice. For example the person may not be sure if to continue a relationship, or to quit a job or make a career change. Irrespective of the person being fully aware of these conflicts, these situations lead to an increase in the level of anxiety and insomnia is one of the symptoms.

Work and social environment

Another area of self reflection is the work environment. We spend 8 hours, sometime more, at work. Is the work place pleasant and friendly? Is there any bullying at work? These are important issues that affect the quality of sleep and the feeling of anxiety and depression during the day.

If the person is retired or not actively working, how is the person spending the day? What interests do they have? Loneliness can give rise to anxiety and depressed mood. Loneliness refers not so much to lack of social interaction per se, but rather to lack of social contact in someone who feels the need for it but who is unable to access social contact.

Sometimes the underlying problems can be addressed successfully, at other times they cannot be resolved. However just the awareness of a personal issue is the first step in treatment. You can do this kind of self-analysis by yourself or with the help of a health professional. The form in appendix 00 can be used to help you organize your thoughts and any issue can be discussed at follow up. Note that it is up to the person to find a solution to any of the daytime issues. The role of the health professional is to help in the process, not to offer a solutions to your problems.

Use of meditation/relaxation.

Meditation and relaxation are very important techniques in managing chronic insomnia. Our life seems to be a continuous race from one activity to another. Often our mind is 'bombarded' continuously with tasks and we have no time off to let our mind rest. Some people use bedtime for reviewing what they have done during the day and often for planning the next day. This continuous mental activity is not conducive to sleep.

Meditation/relaxation techniques in whatever form, from guided meditation tape, imaging, yoga or any of its variants are one way to reduce the buzzing noise of our life.

However, these techniques are often used incorrectly. The most common mistake is to do relaxation/meditation at bedtime *in order to fall asleep*. We should take 10-20 minutes at least once a day, even better twice a day, in the morning or in the evening and usually away from bedtime. If we use the relaxation/meditation at bedtime i*n order to fall asleep* we simply increase our anxiety and our expectation about sleep and often the techniques have a worsening effect.

Relaxation/meditation is a lifestyle decision, which is beneficial to sleep *indirectly* by reducing the level of stress.

The major difficulty in starting and continuing meditation/relaxation comes from our

attitude. Often the person is not disciplined enough to allocate the 10-20 minutes necessary. The continuous compulsion to filling every minute of our life with activity is what predisposes the individual to insomnia and also prevents us to allocate a little of our time to rest our mind.

Awareness of this difficulty is important so that, when our daily planning is telling us that there is no time for the 10-20 minutes meditation, we are disciplined enough to persist with it. Virtually any form of meditation/relaxation is appropriate.

To summarize:

The first part of treatment is to become aware of the importance of daytime personal problems to our disturbed sleep. We should self-reflect on important life issues that are relevant to all of us. Are we satisfied ourselves, with our personal relationships and with our environment? This self-reflection can give the opportunity to explore and clarify some of the issues. *Understanding* is more important than resolving personal conflict.

The relevance of daytime functioning needs to be addressed first. What can be done at bedtime and night time in order to improve the quality of sleep is explained next.

Bedtime advice.

How can we improve bedtime and night time sleep.

Falling asleep is outside our control. As the popular saying goes,

"We can will to go to bed, but we cannot will to fall asleep".

However, we can help our body in the process. The best way is by tapping on the body's own sleep promoting factors. These can be explained as follow:

1. **W**, which stands for prior wakefulness.
2. **C**, which stands for body clock.
3. **M,** which stands for two things; medication-relaxation and also medications.

Sleep depends on prior wakefulness.

The first factor, which determines sleep, is how long we have been awake beforehand (**W** for wakefulness). For example if we were to stay awake for 24 hours, no matter what time of the day it is, we are likely to fall asleep. Some people may argue that they will not fall asleep after being awake for 24 hours. Keep them awake for 48 hours continuously

without being allowed to lie down or close their eyes and almost certainly they will fall asleep. This is based on the fact that the need for sleep is one of the most important needs in life; it is like being hungry or thirsty. At some stage the need to sleep will override any other need. This fundamental requirement is referred to as *homeostatic drive* to sleep.

We want to exploit this principle in a strategy that is called *restriction of time in bed*. For example if a person usually goes to bed at 10pm, fall asleep at 11pm and get up at 7 am, we would suggest them not to go to bed before midnight (physically in bed) and to get up by 6am irrespective of how much sleep the person has obtained and continue doing so for at least 10 days to 2 weeks *(a more precise method to prescribe restriction of time in bed is explained in chapter Four)*.

Two things follow this strategy. The person needs to be aware that their function during the day will get worse because they will actually get less sleep than before starting the restriction of time in bed. However, each day the lack of sleep accumulates progressively more, so that after 10 days to 2 weeks the pressure to fall asleep is so intense that the person tends to fall asleep quicker and to maintain a deeper sleep.

If after a couple of weeks sleep onset occurs within half an hour or so of turning the light off, bedtime can be moved 15-30 minutes earlier, let's say 11.30-11.45pm but maintaining unchanged wake up time. This new bedtime-wakeup time schedule, 11.30pm-6am, is maintained for another 10 days to 2 weeks. If sleep onset occurs within 30 minutes and the person stays asleep, perhaps waking up once, he can then move bedtime a little bit earlier, say 11pm.

This process is repeated again every 10 days to 2 weeks. If sleep quality is satisfactory the person can move *get up time* a little later, say 6.30am. If someone were to sleep between 11pm-6.30am that would be approximately ~7.5 hours sleep, which is the average for our population. However each individual will have a different sleep length need.

It is important to avoid napping through the day and also to avoid falling asleep in the evening while waiting for bedtime.

Please note that it will take ***at least one to two months*** before you can feel the full benefit of this strategy. You need to be made aware of possible worsening of daytime function (more sleepy during the day), and that benefit will take 4 to 8 weeks to become apparent. In restriction of time in bed we are actually causing sleep deprivation, even though in a controlled way. In simple terms we are telling our body: *"This is the window of time you can sleep (say 12MN to 6am). Take it or leave it!"* Initially the usual pattern of insomnia will continue and therefore you are likely to feel worse in the morning. However after a couple of weeks or so the body, driven by the need for sleep (the homeostatic drive), will "take it" and sleep onset and continuity of sleep will start improving.

Problems with restriction of time in bed.

Some people have difficulty following restriction of time in bed because they have job or family commitments in the morning and they cannot afford to be more tired than they normally are for the first 2-4 weeks. In that case we can use medications to help falling asleep at bedtime for the first couple of weeks. We recommend taking one sleeping tablet at bedtime every night for the first week and then every second night in the second week in order to ease the person into the program.

Another objection that people have is that they are unable to stay awake until late. In that case one can adopt a slightly different strategy. For example let's assume that someone has the urge to fall asleep at 9.30pm and cannot manage to stay up until midnight. In that case we recommend the person try to stay awake until 9.30pm for the first week, 10pm the second week, 10.30pm the third week, 11pm the fourth week and so forth until he is able to slowly stay awake until midnight and then start the program as explained above.

'C' for body clock'.

The other important physiological factor that drives sleep is our body clock (called the *circadian drive*).

There is a small area in the deep part of our brain called the supra-chiasmatic nucleus (figure 4), which receives information regarding light and darkness through its connection with the eyes. The body clock synchronizes sleep and wake with the light and night cycling due to the earth's rotation. This is a very important determinant of when we fall asleep and when we are awake. The way the body clock works, in very simple terms, is through the effect of light mediated by a substance called melatonin. Melatonin is usually secreted in a cyclical way through the 24 hours (figure 5). During the day with bright light the level of melatonin in our body is very low, usually not detectable in the blood or in the saliva where it is normally measured. At dusk the melatonin starts rising, stays up through the night with maximal level around 3-4 am and then falls back again at dawn. The cycle repeats on a 24 hours basis *(circadian: circa-diem = about a day)*.

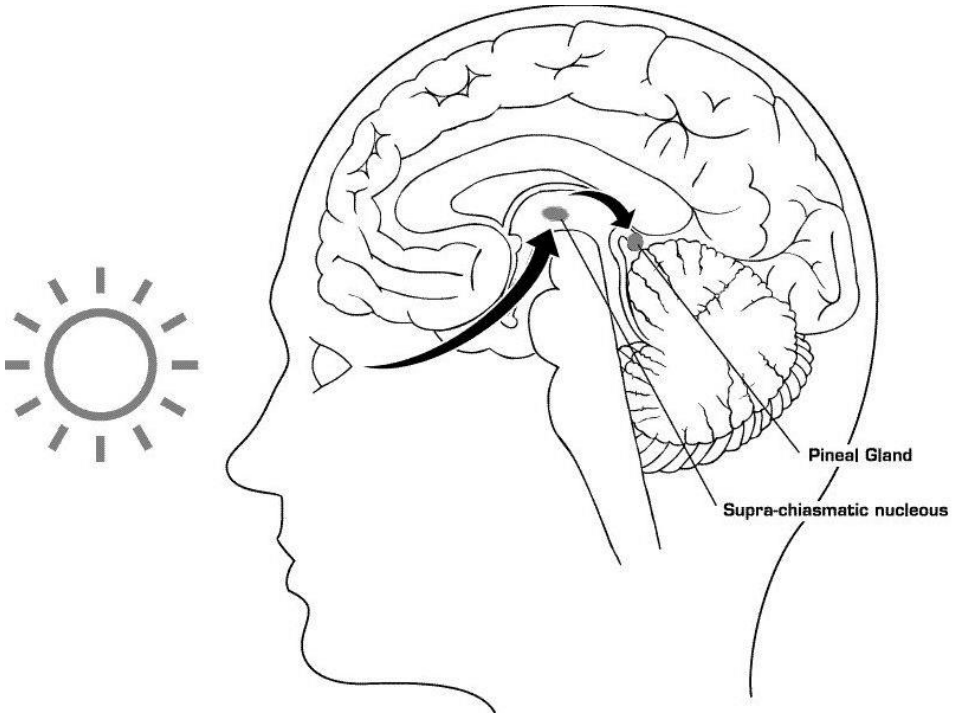


Fig 4

When the melatonin rises at dusk, let's say about 5pm in winter and later in summer, it signals that about 3 to 4 hours later the body can go to sleep. Of course if there is high stress such as something upsetting the person or there is a threat due for examples to a bush fire or flood or any other stress, the person can overcome this signal. However, in normal circumstances, when the melatonin rises in the blood, it gives the signal to the rest of the body that about 3hours later we can go to sleep. Sometimes due to aging, to medications

and sometimes for reasons which are not completely clear, melatonin does not rise, rises late or is very irregular and that can lead to difficulty initiating and maintaining sleep (insomnia). In order to make sure that the signal is present and strong we often give 0.5-3mg of melatonin about 3 to 4 hours before intended bedtime. For example if our recommendation with restriction of time in bed were to be physically in bed at midnight, we would give the melatonin around 8-9pm and we would continue this strategy for at least 8 weeks all through the period of restriction of time in bed.

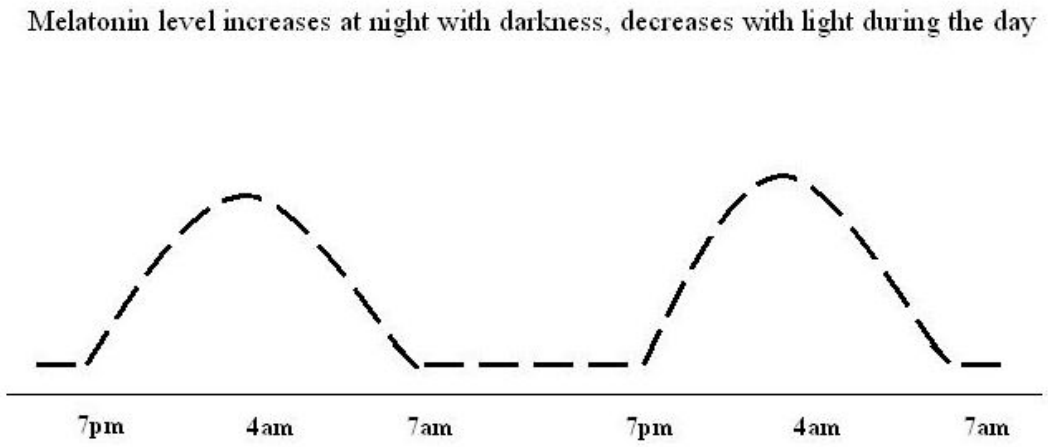


Fig 5

Melatonin is not measured in clinical practice, only for research purposes, as it needs to be sampled in the saliva or blood every 30 minutes. Melatonin is considered a safe substance (see at the end of this chapter a profile on melatonin).

Probably the most well understood example of how melatonin works is in people who are totally blind. This means blind for sight but also blind to light. Some people who are legally blind cannot see properly but they can still perceive light. In most of the people who cannot perceive light the body clock is very irregular and they can suffer from insomnia as a consequence. In these cases the use of melatonin is very effective in re-synchronizing the body with the light and night cycle and promoting sleep.

Restriction of time in bed and *the use of melatonin* reinforce timing, quality and continuity of sleep. We need to continue for at least for 8 weeks, sometimes longer, before a full benefit can be achieved.

This strategy seems to be effective in most cases irrespective of how chronic insomnia started. It is effective in insomnia due to depressive illness and in the population above the age of 60 when the level of melatonin is often declining (figure 6). Probably the most striking example of a very low melatonin is in people with Alzheimer's disease, other forms of dementia and in some cases of Parkinson's disease. Use of melatonin supplementation in these cases can be of benefit and need to be continued long term.

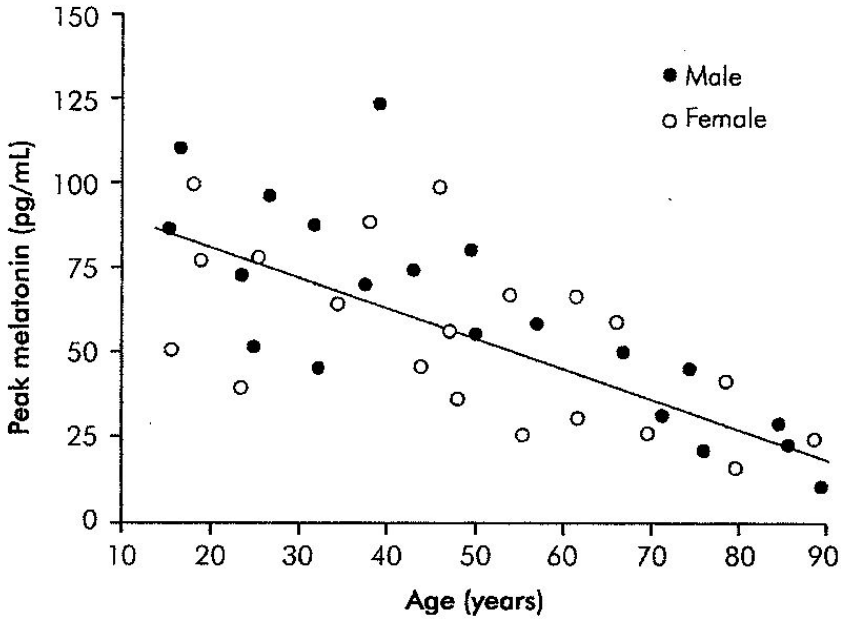


Fig. 6 Melatonin level becomes less and less as we get older.

Some of the medications we use for other medical illnesses could suppress melatonin (table 1). For example beta-blockers (propanolol, metoprolol, atenolol) commonly used for hypertension and in people with coronary artery disease, are suppressants of melatonin production. Also medications that cause depletion of vitamin B6 (important in the synthesis of melatonin) reduce melatonin levels (oral contraceptives, estrogen, hydralazine, frusemide).

Use of light for insomnia.

As described above the body is synchronized by exposure to light. With bright light melatonin secretion is suppressed, with darkness melatonin is released. This knowledge gives us another instrument to help sleep and overcome insomnia.

In order to promote sleep we need to avoid light in the evening. In some susceptible individuals even the light of a TV screen or a computer in the evening can delay sleep onset. In a particular case of insomnia (delayed sleep phase, see chapter 2) exposure to light in the evening tends to push sleep onset well past midnight, sometimes 2am, 3am or 4am.

On the contrary light in the morning helps falling asleep at night. Morning light also increases serotonin levels in the brain that accounts for improvement in the person's mood. So we can use melatonin and light together to our advantage. We use melatonin ~3 hours before intended bedtime, avoid light in the evening and expose ourselves to bright lights in the morning.

Light intensity is measured in lux (light intensity of a candle at one meter distance). The intensity of light needed to affect the body clock changes with age. As we get older we need more light to be effective in synchronizing our body clock. This is part due to structural changes of the eye. The light intensity outside the house even on a cloudy day is usually sufficient. Indoor light is usually insufficient. Artificial sources of light (light box) are becoming popular particularly in winter and at high latitudes when the amount of

daylight is much reduced. Light box can use "white" light, but more recently "blue" light has shown to be more effective. A light intensity between 2,500 and 10,000 lux is most beneficial. This light exposure can be achieved by having breakfast on the veranda or going for a walk after sunrise for 30minutes. Exposure of up to 2 hours may be required if using artificial light indoor.

These simple strategies, restriction of time in bed, the use of melatonin and light are the cornerstone of our treatment often implemented irrespective of the origin of the insomnia. They tend to be particularly effective in improving bedtime and night problems. However it cannot be overemphasized that improving sleep requires addressing the daytime component of our therapeutic strategy as well.

On top of these strategies we also consider a third option, which consists of :

'M' for meditation-relaxation and medication

The use of relaxation-meditation techniques has been discussed earlier in this chapter as part of daytime intervention.

Use of Melatonin

Melatonin is available without prescription and is classified worldwide as a natural substance rather than a medication as such. Although this makes melatonin widely available this also makes the formulation of melatonin much less reliable. Therefore the best option is to have the melatonin prepared on purpose by a compound pharmacist. Hopefully in the future a synthetic melatonin or melatonin-like medication may be available (one is currently available in North America). A 2 mg slow release formulation is also available in some countries (Circadin™). The usefulness of slow release formulation is doubtful.

Melatonin has also other properties. It is a potent anti-oxidant, has immune-modulatory activity and may reduce the risk of malignancy.

Side effects of melatonin.

Melatonin is considered safe at the recommended doses, which varies between 0.5mg and up to 6mg. In most cases side effects are not different from placebo (a dummy capsule). However, symptoms such as fatigue, 'dizziness', headache and irritability and nausea are sometimes reported

Some attention has to be paid in the following situations.

1. *Warfarin*. Melatonin may increase the activity of Warfarin and therefore if the patient is on anticoagulants, such as Warfarin, the activity of the medication has

to be monitored.

2. *Diabetes on insulin*. Melatonin may increase the sensitivity to insulin in predisposing individuals and increase the risk of hypoglycemia.
3. *Blood pressure*. Melatonin may cause a drop in blood pressure, which may be relevant particularly in the elderly and in patients who are already on blood pressure medication.
4. *Pregnancy and breastfeeding*. Because of its action the use in pregnancy and in women planning to become pregnant is usually discouraged. Also the safety in women breastfeeding is not clear and should be avoided.
5. *Children*. The use of melatonin in children before puberty should also be undertaken only if necessary and under medical supervision.

Timing of melatonin administration.

Although it has been claimed that melatonin has a sleeping tablet-like effect, and therefore could be given just before going to bed, the best use of melatonin is to be taken about 3-4 hours before intended bedtime. The main activity of melatonin is of synchronizing the body function to favour sleep onset rather than inducing sleep. This is to say that if the person is under stress or is unable to switch off his thinking, melatonin is unlikely to put the person to sleep.

It should also be noted that taking melatonin at the wrong time of the day might actually have a reversal effect (disturbing sleep). For example melatonin taken in the morning, rather than the evening may delay sleep onset at night.

The use of sleeping tablets.

Over the last 20-30 years the prevailing view is that using medication to fall asleep is a 'bad thing to do'. People have been made to feel bad about using sleeping tablets. This is often the result of misunderstanding and a negative attitude on the part of authority and to some groups of health professionals.

The use sleeping tablets is like the use of any other medication. If used in the appropriate circumstances and under proper supervision they are safe, effective and appropriate.

Over the last 20-30 years the availability of medications that are more effective and safer makes the use of sleeping tablets a much better strategy when appropriately used. Proper use of medications to promote sleep is similar to the use of painkillers when someone has pain. You can use paracetamol or aspirin in someone who has a headache for a few days. In the same way you can use sleeping tablets when the person is particularly stressed and finding it difficult to relax.

The medications that can be used are listed at the end of this chapter. In particular short acting benzodiazepine such as Temazepam or similar that works between 8-12 hours, and therefore minimizes any spilling effect during the day, can be used safely for a few days when necessary.

The new group of sleeping tablets which are labeled the 'Z' sleeping tablets (zolpidem, zopiclone and zapleton) are also safe. Some of these medications have received bad publicity in the media because they can increase the risk of sleepwalking and other movement during sleep. This is true but is a relatively rare event considering the amount of medication used worldwide. The Z medications seem to have some interesting features. Firstly they have a very short action, between 4-6 hours, and therefore the risk of side effects during the day is small. The risk of rebound (worsening of insomnia) when the person stops the medication is also small.

It is interesting that the media focuses attention on the 'Z' medications in terms of increased motor activity during sleep but they totally ignore the fact that most of the antidepressants available nowadays can also increase motor activity and a simple molecule like Lithium for example can also increase the risk of sleep walking.
Of course sleeping tablets do not cure insomnia but they may be helpful at times.

The following are common indications:

Transient insomnia (insomnia which lasts a few days or a week or so). The person is usually aware of the reason for the insomnia and the use of sleeping tablets may help the person resting and therefore minimizing the effect of insomnia on daytime functioning.

Chronic insomnia refractory to other forms of treatment. There are some cases where insomnia has been present since childhood (childhood onset insomnia) in which the use of medication may have to be continued long terms; however these are rare situations. In patients in whom cognitive –behavioral therapy is not successful (up to 30%) sleeping tablets may need to be used, at least intermittently (e.g. 3-4 days a week).

Chronic insomnia in the presence of other sleep problems such as restless leg syndrome or anxiety disorder. In these cases the use of benzodiazepine (e.g. temazepam, clonazepam) has a role in improving the underlying primary sleep disorder (restless legs), anxiety and insomnia.

Sleeping tablets are *preferably avoided* or to be use with extreme care in the following situations:

In pregnancy and breast feeding.

People with severe obstructive sleep apnoea.

People with a previous history of recreational drug abuse including alcohol.

People with certain occupations such as commercial drivers, heavy machinery operators, people who are on-call and may be called to attend their work in the middle of the night. However in these groups insomnia itself can be detrimental and the benefit of improving sleep length and quality may overcome the potential side effects of using

sleeping tablets.

In the *elderly patients* a smaller dose needs to be considered.

Generally long-term use of sleeping tablets is not to be recommended but in conjunction with the other strategies explained in this chapter can help the person overcome insomnia. There is evidence that use of sleeping tablets can be effective for up to 12 months, although the "usual" recommendation is to be used for no more than four weeks.

The current sleeping tablets available are listed in the table 2. It is preferable to use medications that have a short length of action between 2-8 hours so that there is no after effect during the day.

Risk associated with taking sleeping tablets.

Like with many other medications certain symptoms may occur such as light-headedness, dizziness and sometimes unsteadiness particularly if the medication is in excessive dosage.

Daytime sleepiness. This is seen predominantly with medications that have a long action. The most recent medications such as temazepam, triazolam and zolpidem and zopiclone have short action and the probability of daytime sleepiness is low.

Rebound insomnia. This refers to the worsening of insomnia once the medication has been stopped. This is usually seen in people who are on sleeping tablets for a long time and stop suddenly. The rebound insomnia, however, is only of short duration. It should also be noted that rebound insomnia occurs even when the person is given placebo (a dummy tablet).

Daytime anxiety. With some medication, particularly the benzodiazepine (Triazolam) some people may experience an increase level of anxiety during the day due to "rebound" effect.

Another concern with the use of sleeping tablets is possible *disturbance in body balance* which can increase the risk of fall. This risk seems maximal in the first few days of use. The longer the action of the sleeping tablet, the more it is likely to affect balance during the day. However even medications with shorter action could increase the risk of falling in patients who get up in the middle of the night. It should however be noted that insomnia itself may lead to increase in risk of lack of balance. Therefore in patients with chronic insomnia the overall effect depends on the benefits from improving insomnia versus the risk of side effects.

The concern about the *increase risk of motor vehicle accidents* in patients on sleeping tablets has also been raised. However sleep disruption due to severe insomnia may also lead to increased risk. Again in prescribing sleeping tablets the benefit versus risk need to be taken into consideration.

Over the counter sleep aides.

There are many over the counter preparations used for insomnia, usually antihistamine (e.g. Diphenhydramine 25-50mg, Snuzaid™, Doxylamine 25mg, Restavit™), which are frequently used and are effective. However, they cause daytime drowsiness and sedation, dry mouth, voiding difficulty and occasionally increase intra-ocular pressure (glaucoma). Therefore this kind of preparations is best avoided.

'Natural' products.

There are a variety of natural products available such as Valerian, chamomile, lemon balm, hops, passion flower, Kava Kava, lavender.

Valerian is an ancient remedy for insomnia. Valerian contains a substance, which is similar to benzodiazepine (Valium), which may explain a partial effect as a sleeping promoting agent. It is also said that it may increase the secretion of melatonin.

The use of valerian should be continued for a few weeks before a beneficial effect can be experienced. Using valerian for a few nights does not appear to be beneficial.

The limited experience with Valerian suggests no significant side effects and no significant withdrawal symptoms. There is some concern about the potential effect of some of the metabolites of Valerian in the experimental setting and therefore it is preferable to avoid valerian during conception and during lactation.

Kava Kava is a common beverage in the South Pacific. It is said to have an anti-anxiety effect and a kind of action which that may resemble benzodiazepine. There are a variety of formulations and different dosages. One possible concern of the side effects of Kava Kava containing medication is liver failure. Another side effect of concern is discoloration of the skin with a yellowish hue.

Lavender is also used as a relaxant, often as aromatherapy. The effect of lavender on sleep is not well documented but it may have a beneficial effect indirectly through reducing the level of anxiety.

Many other 'natural' sleep aids are available such as chamomile, lemon balm, hops, passionflower and skullcap. There is very little evidence that they improve sleep. However, in individual cases they may be beneficial.

Table 2

Medication	***Duration of action***	***Absorption***	***Dose***	***Comments***
Temazepam (Normison™, Temaze™)	Intermediate (5-15 hr)	30-60 min	10-30 mg	Very safe profile, minimal daytime residual effects. Capsules have faster absorption than tablets.
Zolpidem (Stilnox™)	Short (~2.5 hr)	30-60 min	5-10 mg	Use the smaller dose in the elderly. Safe profile, with minimal daytime effects
Zoplicone (Imovane™)	Short (~ 5.2 hr)	60-90 min	3.25-7.5 mg	Erythromycin increases its concentration, side effect due to metallic taste. Smaller dose in the elderly
Triazolam (Halcion™)	Short (1.5-5 hr)	<30 min	0.125-0.25 mg	Fast and short action, can be associated with daytime anxiety, anterograde amnesia, and rebound insomnia (rare).
Oxazepam (Serapax™)	Intermediate (4-15 hr)	60-120 min	15-30 mg	The slow absorption makes it not suitable for sleep onset insomnia
Lorazepam (Ativan™)	Intermediate (12-15 hr)	30-60 min	1-4 mgr	More commonly used as anti-anxiety rather than hypnotic
Diazepam (Valium™, Ducene™)	Long (20-120 hr)	30-60 min	2-10 mg	Not indicated for management of chronic insomnia except within the context of anxiety disorder
Nitrazepam (Mogadon™)	Intermediate/Long (15-38 hr)	Variable 60-120 min	5-10mg	Not recommended in the management of chronic insomnia

Note: There is a wide difference in how each person responds to the above medications. Doxepine, an antidepressant, used in small doses (3-6 mg) appears to be effective in

chronic insomnia.

Table 3

Increase	**Decrease**
Chlorpromazine Tranylcypromine Endorphin Fluvoxamine Lithium Tetrahydrocannabinol Agomelatine*	Alprenolol Atenolol Metoprolol Propanolol Benzodiazepine (alprazolam) Clonidine NSAID's (ibuprofen) Fluoexetine Sodium valproate (Epilim™) Caffeine

NSAID's: non steroideal anti-inflammatory drugs.
*Agomelatine is a new antidepressant that also increases the melatonin level.

Chapter 3

Insomnia Cases

The following are some examples of people who have presented with chronic insomnia. These are common presentations of chronic insomnia.

As is often the case in real life people do not fit neatly in categories and most of the people described below have chronic insomnia that is a result of more than one issue. Some cases are satisfactory success stories where chronic insomnia has been treated to the satisfaction of the person. In other cases there has been improvement in their symptoms but there are also cases of failure. Perhaps discussing failure of managing chronic insomnia is of particular value in understanding where we can do better with it.

Primary insomnia (learned insomnia)

In the past it was common to make the distinction between primary and secondary insomnia. In primary insomnia the difficulty with sleep is the "core" problem. In secondary insomnia, the disturbed sleep is *due to* other specific problems, for example body clock disorder, substance abuse or depression. The distinction is however somewhat artificial and blurred. As mentioned in the previous chapters a component of "learned insomnia" is common to all forms of insomnia.

Primary insomnia describes a chronic insomnia where the psycho-physiological mechanism explained in the previous chapter (IO) is a predominant issue. This refers to a state of increased arousal that tends to interfere with continuity of sleep. This kind of insomnia is also referred to as *learned insomnia*.

Mr. SP is a 37 year old father of 2 boys and a manager of a local club. He is a non-smoker and he drinks up to 10 standard drinks/week. He is on 2-3 coffees/day. He is a fairly healthy man otherwise who at the time of the assessment has been using intermittently Restavit™ or Phenergan™ (both have an anti-histamine effect to help sleep). He presented complaining of lack of sleep, poor sleep quality and daytime fatigue. He is on no regular medication. He describes being unable to initiate sleep and stay asleep on and off for many years but more prominent in the last 12 months. It was obvious that the worsening of his sleep problem was linked to his job. Because of reduction in the activity and the earning of the club there was concern about the future of the industry and most uncertainty about his own future in the job. It was not uncommon for SP to have difficulty switching off at night and waking up through the night and thinking about his work.

He would normally go to bed between 9-10pm falling asleep sometimes within 30

minutes but sometimes it would take a few hours to fall asleep. He rarely fell sleep after midnight. He would wake up 3-4 times per night usually for prolonged periods and he had difficulty going back to sleep. He was a snorer but there were no features suggestive of sleep apnoea (snoring and stopping breathing). He was a restless sleeper who would get up between 6.15-6.45am depending on the day of the week. He would not take a nap through the day but he could occasionally on weekends. He has been drowsy driving long distances and watching television.

Despite the reported difficulties at work he had no evidence of anxiety or depression.

One of the main complaints from SP was the level of tiredness mostly mental tiredness during the day, with inability to concentrate for prolonged periods.

We spent a good time of our meeting discussing how, in his case, sleep was more likely to be affected by the circumstances he was finding himself in compounded by his personality, being a person who tends to be hyper-alert and with difficulty switching off. We also discussed how, in his case, circumstances during the day, specifically the uncertainty in his job, the pressure from management to make the club profitable, the potential risk of losing his job and his income were the primary movers of his poor feeling during the day and indirectly affecting his night time sleep. By the same token not being able to sleep well would make him feel worse during the day in what becomes a vicious cycle.

We stressed the importance of awareness of the daytime issues expressed above. He implemented restriction of time in bed going to bed around midnight and getting up no later than 6am for the first two weeks together with the use of Melatonin (3mg) about 9pm. He also understood the importance of relaxation and meditation. An appointment was made to review him in about 4 weeks.

At follow-up there was some improvement in his sleep continuity but not as satisfactory as he would have expected. He was unable to spare the time for relaxation and meditation because he was too busy and he relied on the medication more than we had planned. The issues discussed in the first encounter were revisited and in particular the importance of having some strategy and some alternative in case his occupation as a manager of a club was in doubt and at risk.

Although he felt that his job was not at risk, we discussed the importance of having a strategy and alternative in the worst case scenario. Again the importance of a critical review of daytime in order to improve bedtime and sleep was emphasized. He continued with restriction of time in bed and the use of Melatonin. After a further 4 weeks he underwent a formal sleep study that showed regular bedtime around 11.30pm and sleep until 6.30am. There were a couple of awakenings in the middle of the night for about 10 minutes but he perceived he had been awake for almost an hour on both occasions. This is not uncommon and is referred to as *sleep misperception*. This is to say that the subjective feeling of the person of being awake is much longer than what actually happened which is very much in keeping with an element of hyper-arousal (see page).

Mr. SP continued with restriction of time in bed maintaining bedtime no earlier than 11.30pm.

Insomnia due to difficulty adjusting to a new situation

Mrs. Hanna is a 57 year old lady who presented with difficulty initiating and maintaining sleep over the last 8 months. She is a non-smoker with minimal alcohol intake and 4 cups of coffee per day. She describes some difficulty starting and maintaining sleep going back about 4 years at the time of a car accident, which caused some spinal injury. However the difficulty with sleep has been particularly problematic over the last 9 months. This corresponded to her resettlement back to Newcastle from South Australia. She had been living in Adelaide following her husband who was a senior executive for a manufacturing company. They had been in Adelaide for 10 years even though she would regularly come back to Newcastle every year to visit the family.

About 4 years ago when she was involved in a motor vehicle accident she had a few months of difficulty initiating and maintaining sleep mostly related to the accident and some back pain, which prevented her from sleeping. However, following rehabilitation her sleep had gone back to normal.

About 9 months prior to this presentation following her husband's retirement the couple moved back to Newcastle. This has been a difficult period for both the patient and her husband. The husband had major difficulties adjusting to a new lifestyle after having been a very busy person. It created some difficulty within the marriage. Mrs. Hanna also had settled well in Adelaide having developed a network of friends and although keen in coming back to her country of origin she was ambivalent about moving back to Newcastle. Although she walks every morning, attends the local church and is involved with the local community, she does not feel fully satisfied at the end of the day. She is missing the friends and relationship that she had developed over many years in the other country.

She goes to bed between 10-11pm and falls asleep between 30 minutes – 2 hours. She has no history of snoring. She is not a restless sleeper, however, she tends to wake up a couple of times per night for up to 30 minutes and eventually she has a final awakening between 3-6am. She tends to feel unrefreshed. She does not nap through the day.

She is not an anxious person, she is not depressed and she has a good understanding of her condition.

Our discussion initially focused on the difficulty that the couple had encountered in readjusting to a new lifestyle. The husband, who had been spending most of the time away from home, was now spending most of his time at home and he had difficulty readjusting to a less busy lifestyle. This appears to reflect, to some degree, on Mrs Hanna who, although happy to have more time to spend with her husband, needed to adjust to a new set of situations.
Reassessing her decision to move back to Newcastle it became more obvious that the decision was somewhat difficult and she was not completely sure about moving back. There were lots of positives, particularly being back where she was born. However,

she had developed a fairly strong network of friends in Toronto and she could have easily decided to remain in South Australia. This kind of tension has not really been completely resolved and it would be one reason for her poor sense of well being during the day.

In this case it is essential that the person is aware of this tension and starts developing some strategies to get more involved locally.

As far as her sleep is concerned the daytime issues would certainly have affected it. We agreed in undertaking restriction of time in bed going to bed around midnight. Wake-up time is fairly fixed; being an early person she would get up at 6am and avoid any naps through the day. She was also started on Melatonin 3mg at 9pm to be continued for the following 4-8 weeks.

At follow-up about 4 weeks later Mrs. Hanna had made progress in becoming progressively more involved in the local community. She has also become progressively more aware of the uncertainty about moving back to Newcastle but she is now settled and determined to make the most of it. Her sleep quality has improved even though some nights she still has some difficulty remaining asleep. Overall her sleep quality and her daytime functioning were improved. Melatonin was stopped about 6 weeks after starting it and her overall sense of well-being was maintained.

This is an example of how difficulty initiating and maintaining sleep can be associated with a significant change in lifestyle such as moving home or state. Any situation where there is a significant change in lifestyle can potentially lead to some degree of tension and anxiety and this may reflect in the sleep quality which becomes poor. Not being able to sleep well, of course, would make daytime functioning progressively worse and the two issues would compound together to result in a poor sense of well being.
Other situations that can lead to similar presentation include a change in occupation, changing school, moving out of the family home, becoming a retiree, to mention a few examples.

Insomnia due to body clock problems

As mentioned in chapter 1 an important determinant of the ability to fall asleep and stay asleep is our body clock. The body clock can be malfunctioning for a variety of reasons. Sometimes it is a genetic problem, other times it is related to recreational substances or prescription and non-prescription medications. In other cases no specific reason is found. The following two examples are cases of body clock problems, which are causing difficulty initiating sleep and waking up too early with important negative consequences for the person.

Insomnia due to "body clock" problem (delayed sleep phase syndrome)

Miss Petra is a 15 year old young teenager who is referred because of severe difficulty initiating sleep over the last couple of years even though even as a young girl she used to

go to sleep no sooner than 11.30pm-midnight. Currently Petra would go to bed about midnight but she would not be able to fall asleep until about 3-4am. Consequently she would sleep in until 11am, sometimes 2-3pm. As a consequence of this problem with sleep she had to abandon school because of the inability to stay awake at school and perform. Because of the poor performance and the inability to continue school she has become depressed and somewhat blamed by the family for being lazy and not sufficiently motivated. She was on an antidepressant (Cipramil™ 20mg in the morning). She is a non-smoker with no history of recreational drug use and she would take less than one caffeinated beverage per day. There was a family history of depression in her mother. Mother and father were separated.

Here the clinical picture is very much in keeping with a body clock problem that the health professional refers to as *delayed sleep phase syndrome*. In this condition the person is unable to fall asleep before midnight and more commonly before 1-2am and in more severe cases, like Petra, 4-5am. Once sleep is started it tends to be maintained smoothly after that. However, given the time of sleep onset the person tends to sleep until midday, sometimes 2pm. With this kind of body clock the person is unable to attend school and if they do attend school they are so sleepy that they cannot learn. Therefore it is important that this condition is recognized early so that the person is not disadvantaged in their school education.

In this situation a complicating factor is the negative consequences both in terms of family relationships and school for the person, who has become secondarily depressed and sometimes, like in this case, inappropriately accused of not being motivated enough.

There was no need for formal assessment as the clinical picture is sufficient to clarify the reason for the difficulty initiating sleep.

Petra was started on restriction of time in bed whereby she would go to bed no sooner than half past midnight and she had to get up by 7am irrespective of the amount of sleep obtained. She was asked to minimize any light after 11pm. However, bright light was encouraged after 7am. She was also started on 3mg of Melatonin at 9pm (3 hours before intended bedtime). The program was continued for about 2 weeks and then bedtime was moved slightly earlier around midnight. If sleep onset was achieved within half an hour of going to bed, then bedtime would be further anticipated 15 to 30 minutes earlier, such as 11.30pm. It was very important to maintain wake-up time at 7am irrespective of how much sleep she obtained.

At follow-up about 4 weeks later sleep onset was around midnight and sleeping through until 7am. For a person of 15 years of age 8 hours is probably still short of the requirement but was much improved compared to prior starting treatment. The patient was reassessed again 4 weeks later with the ability to fall asleep by 11pm and getting up at 7am. She now plans to restart study at TAFE. The antidepressant was also phased out over a period of a few weeks.

It was very important for this young teenager to understand that there was a physiological reason why she could not fall asleep. It was not a matter of unwillingness and it was definitely not a matter of being lazy. This was also to the relief of the parents who felt somewhat guilty of unjustly accusing the young daughter.

The problem of delayed sleep phase syndrome (the inability to fall asleep until the early hours of the morning) is very common in teenagers who have a series of factors that are working against their ability to fall asleep. To start with, the body clock of teenagers tends to move progressively later, so that physiologically they do not feel sleepy until late in the evening. By the same token the schools demand requires that they wake up in the morning earlier than they would otherwise and this causes chronic lack of sleep.

Other factors such as peer pressure, television and the Internet also contribute to a late bedtime.

One potential resistance to the above treatment, which however was not the case in this patient, is the objection of evenings out on weekends. The possibility of staying out until 4am on Friday and Saturday is not negated by the treatment. If a young person like Petra were to stay up until 2-3am on weekends she would still need to get up at 7am so that the body clock would immediately catch up the following night. However, if the person *sleeps in* on weekends until midday then there is a progressively more shifting of the body clock later and later at night, which would worsen their body clock problem.

It should also be recognized that the person suffering from delayed sleep onset needs to be motivated in wanting to do something about it.

Insomnia due to "body clock" problem (advanced sleep phase)

Mrs. Debbie is a 70-year-old lady who had difficulty maintaining sleep over the last 3 years.

She described daytime tiredness over at least the last few years. She is known to be a snorer but not every night and there is no history of stopping breathing.

She normally goes to bed around 8-8.30am and falls asleep within 30 minutes. She seems to be sleeping reasonably undisturbed until about 3am. After she wakes she has difficulty going back to sleep and she dozes on and off until 6 am when she gets up. Initially she feels refreshed, however, as the day passes she gets progressively sleepier and in the early afternoon she has the need to take a nap for about 30 minutes. She has been drowsy driving and sometimes while in company of other people.

A simple screening test at home (oximetry, *an oxygen monitor*) revealed no evidence of sleep apnea although she is a snorer. She has no symptoms suggestive of anxiety or depression. She is married in a satisfactory relationship.

Her diabetes is well controlled on medication.

The picture here is very much in keeping with a body clock problem, which we described as *advanced sleep phase*. This refers to the fact that the person tends to be

ready to fall asleep early in the evening, sometimes 7pm or 8pm. Waking up at 3am Mrs. DB would have slept approximately 7 hours fulfilling her sleep requirement and therefore having major difficulty falling asleep again. However, waking at 3am each morning means a very long day and by the time the early afternoon arrives the person feels the need to nap.

In this case the difficulty maintaining sleep is related to a very early (extremely early) body clock, which is the opposite of the previous case.

Having understood the origin of the problem, we implemented a strategy of slowly delaying bedtime half an hour every week until she was physically in bed around 10.30-11pm. We also suggested having a well-lit room in the evening, because bright light helps delaying sleep onset. We also prescribe Melatonin 3mg at 7am. The combination of slowly delaying bedtime half an hour every week plus the use of light in the evening tends to move the body clock progressively later. By the same token the use of Melatonin *in the morning* tends to delay sleep onset in the evening. The effect of melatonin depends on the time of the day it is taken. In fact if taken at the wrong time of the day it has no effect at all or it may even worsen sleep.

After about 3 months of this strategy she reported being able to go to bed around 10pm and waking up around 5am which was better sleep structure than before. She felt more alert during the day.

This is another example of how insomnia, in this case difficulty maintaining sleep, was actually related to a body clock problem. Other causes of fragmentation of sleep such as sleep apnea or emotional issues such as depression were excluded.

Insomnia and the menopause (a challenging condition)

Mrs. Joan is a 49 year old lady who was referred with difficulty initiating and maintaining sleep over a 9 month period. She had been seen previously because of night sweats, said to be related to menopause. At the time of presentation she had intermittent menstrual periods suggestive of going through menopausal changes. She has a history of low thyroid hormone treated with hormone replacement. She is a manager of a retail shop working between 9am-5.30pm, 4 days a week and the other 2 days a week she helps in the family business.

She describes herself as a busy person. Her functioning during the day has deteriorated sharply since her sleep problem started about 9 months prior to this presentation.

She goes to bed between 11-11.30pm and not being able to fall asleep until 2am, sometimes 3am. She eventually gets up about 7am but if left undisturbed she sleeps in until 8-9am. This history is already suggestive of an element of delayed sleep phase, which is a body clock problem (see page xx).

She is taking Inderal™ as a prophylaxis for migraine. This medication is a beta-blocker and known to suppress Melatonin secretion, which could be a contributing factor to her timing problem.

On specific enquiry although she is a very busy person she could not recognize any specific reason for the onset of her symptoms 9 months previously. She had no evidence of symptoms suggestive of psychological stress.

The local doctor started her on hormone replacement, but there was no significant benefit.

She was advised to restrict time in bed, going to bed at midnight and getting up by 6.30am, and the use of Melatonin 3mg about 9pm. She was also encouraged to consider review of her busy schedule during the day and instructed on relaxation techniques.

Four weeks later at follow-up there was no significant benefit by the above intervention. She admitted that she had not been able to do any relaxation and of not being able to reduce her activity during the day. Her view was that what she needed was some kind of tablet to help her sleep stating that she was too busy to do any of the strategies recommended during the previous encounter.

A sleep study was arranged which documented poor sleep quality with lengthy time before being able to fall asleep and waking up through the night.

At further follow-up an attempt to modify her bedtime and daytime behavior was unsuccessful with the patient requesting to be given something to help her sleep. She was maintained on Melatonin at 9pm and started on Temazepam (a Valium-like medication of short action) half an hour before bedtime, which was maintained around 11.30pm. The choice of the Temazepam was dictated by the difficulty Sandra had in switching off at bedtime. She reported much improvement in her sleep quality that was actually confirmed by follow-up sleep study showing that the patient fell asleep quickly after switching the lights off and the sleep structure was much improved.

She did not attend follow-up after the second study. However, 3 months later she re-presented indicating that the 'medication was not working anymore'.

Mrs. Sandra was taken again through the importance of critical review of her daytime functioning and the 'business' of her lifestyle and the need for 'time off' during the day. The suggestion again was ill received with the comment that she was far too busy to bother with this kind of strategy. She needed something again to fix her problem. She did not return for further advice.

Comment: This highlights some important issues relating to insomnia. In this case there was an element of delayed sleep phase, which was corrected by the use of Melatonin and a more regular sleep pattern. However, the quality of sleep remained poor. The suggestion of modification of daytime functioning was not implemented. This can be related to objective inability to change her lifestyle and an unwillingness to do so.

Of interest is the relationship between difficulty with sleep and the menopause. This is a complex relationship. Not all women who go through menopause do have sleep

disturbances. Approximately one third have sleep disturbances associated with the menopause. It is claimed that the hot flushes are the reason for the sleep disturbances. However, when objectively tested there are women with the same amount of night sweats who do not have sleep disturbances, so the link between hot flushes and insomnia is not certain.

Of further interest only a minority of patients who go onto hormone replacement do actually have an improvement in their sleep quality. At present the relationship between menopausal changes and insomnia remains uncertain and needs to be studied further. There is definitely individual variability in how a person responds to hormonal changes.

Estrogens replacement is associated with an increase in the amount of slow wave sleep ("deep sleep") and REM sleep. Estrogens also has a positive effect on mood, which tends to be depressed at menopause. In practical terms it makes sense to provide a person with hormonal replacement (low dose) and see if that makes a difference to their quality of sleep.

The level of melatonin is also reduced in postmenopausal women with insomnia, and therefore a trial of melatonin (0.5mg to 3mg) should also be considered, 2 to 3 hours before intended bedtime.

This case represents a difficult case in managing insomnia. A situation like the one explained in this case is not uncommon whereby the person is reluctant to take responsibility for her own symptoms and treatment. There is an expectation that the health practitioner will provide a solution with minimal effort on the part of the person herself. This is usually doomed to failure in the long run. It is a common scenario whereby the use of sleeping tablets seems to be helpful for the first few weeks and then the person's pattern of sleep recurs. The step repeats itself whereby a different medication is sought which will work for a few weeks and the symptoms continue on and off for months, sometimes years.

In the case of insomnia it is important that the person takes charge of her own treatment rather than expecting the health practitioner to provide the full answer. Medications (sleep tablets) have a role and can be used, but they are rarely the solution. In cases where cognitive behavioural therapy is unsuccessful or not accepted (up to 20-30% of cases), the use of sleeping tablets need to be considered provided the patient understand theirs limitations.

Insomnia due to chronic medical conditions

Paula is a 60-year-old lady with a 3 year history of difficulty initiating and maintaining sleep, which is associated with daytime tiredness. Her main medical problems include osteoarthritis and osteoporosis requiring a left knee replacement and stable angina.

She normally goes to bed between 10pm-midnight but it takes her at least 1½ hour to fall asleep. She wakes 2-3 times per night usually with shoulder and lower back pain. Her final wake-up time is about 6am. After that she dozes on and off until 7.30am when she would get up feeling unrefreshed.

Gladys had no history of snoring. She had no history of depression or anxiety. She has some degree of restless legs syndrome at least 2-3 times a week. On occasion she has used some sleeping tablets like temazepam and zolpidem but only with limited success.

In Gladys's case the difficulty falling asleep and staying asleep seems to be related to at least two issues. One is fragmentation of sleep due to chronic pain because of the osteoporosis and osteoarthritis affecting her shoulder and back. The other is restless legs. Her sleep pattern of falling asleep often after midnight suggests delayed sleep phase.

Gladys was asked to maintain a regular bedtime between 11.30pm-6.30am irrespective of how much sleep she had obtained. She was also asked to avoid napping through the day. She was given Melatonin 3mg to be taken around 9pm and a small amount (5mg) of slow release morphine to take about 10.30 pm (an hour before intended bedtime).

At follow-up 2 weeks later she was happy to report a significant improvement in sleep quality. She continued Melatonin for 4 weeks and her sleep pattern has remained of good quality at the follow-up 6 weeks later.

In this case the problem with Gladys's sleep quality was related principally to fragmentation of sleep due to chronic pain. We tend to move in bed every 20-30 minutes. Even people who feel they have gone to sleep in one position and wake up in the same position actually do change positions regularly. The presence of a chronic painful condition is a common reason for fragmentation of sleep. Therefore management of the chronic pain is essential to improve the quality of sleep and treat insomnia.
In this case the choice of slow release morphine was geared at reducing the pain due to the osteoarthritis and osteoporosis as well as to the management of restless legs syndrome.

Restless legs syndrome, although in this case mild (only 2-3 times/week), was nevertheless an important issue. Restless leg is characterized by a sensation of creepy crawly feeling in the calves, sometimes in the thigh and even in the arms. The person has a need to move around to relieve the discomfort. In rare cases the trunk and the head can be involved. This can often prevent the person from falling asleep at bedtime. Although there are a variety of medications that can be used for restless leg, including anti-Parkinson medication (Sifrol®,Reprive®), benzodiazepine (Valium™ group kind of medications, like temazepam (Temaze®, Normison®) and Clonazepam (Rivotril®) the use of slow release morphine or similar medications are also very effective. It should be noted that morphine given to a "healthy" adult (in experimental conditions) makes sleep quality worse. Not so when used in people whose sleep is disturbed by chronic pain. In some people pain killers like paracetamol can also be effective.

Because of the degree of delayed sleep phase (falling asleep after midnight) the use of Melatonin at 9pm (about 3 hours before intended bedtime) was also useful for the first 3-4 weeks.

Other medical conditions, which often can cause insomnia include: gastric reflux,

poorly controlled asthma, severe emphysema and chronic bronchitis, heart failure, prostate problem and chronic arthritis (e.g. rheumatoid, lupus). It is therefore important that these conditions are well treated and controlled by your family doctors and health professionals.

Insomnia and substance abuse

Francesca is a 18-year-old university student referred because of daytime tiredness and inability to fall asleep and stay asleep. The history is going back at least 4 years when at the age of 14 she was diagnosed with depression and anorexia. At the time she was treated with antidepressants with a partial improvement in her mood. However, her sleep pattern remained quite disturbed. Currently Francesca is attending university and she lives away from home with other university students.

Her current sleep pattern is characterized by going to bed between midnight-1am and not being able to fall asleep until 3-4 am. Once she has fallen asleep her sleep is quite fragmented with recurrent awakenings. If left undisturbed she would wake up around midday but on university days she has to get up at 8am. According to her family Francesca has been a 'poor sleeper' since she was a toddler. She suffered from frequent night terrors.

Initially Francesca attended with her father at the first interview. She was seen again on her own and on that occasion she admitted being a current smoker of marijuana in the last 6 months (4 cones a day, usually in the evening). Her caffeinated beverage intake was very high with 500ml of Coke first thing in the morning and at least 3 litres during the day. She felt that in the evening she would not be able to fall asleep without having some cannabis. She also admitted to once every 10 days or so of staying awake all night without being able to fall asleep.

Although her current sleep pattern was causing significant problem with the university lectures and exams, she did not display symptoms of morbid depression.

We had a good discussion about her sleep pattern and, similar to the previous case discussed, Francesca has evidence of delayed sleep phase (her inability to fall asleep before midnight). However, there was also significant fragmentation of sleep. We explained to Francesca that the use of cannabis to any level, but certainly to the level that she was smoking, would be an important contribution to her inability to fall asleep. The use of caffeine to the extreme amount she was taking would also be a reason for fragmentation of sleep through the night.

The insomnia in this case is *a symptom* of *substance abuse* (cannabis and caffeine) resulting in fragmentation of sleep and delayed sleep phase.

A major difficult for Francesca was to readjust her body clock and slowly withdraw from the amount of substances she was using.

She was willing to modify her behaviour and over a period of 6 months she was taken through a slow withdrawal from both cannabis and caffeinated beverages with the help

of the Drug and Alcohol unit at the local health service.

She started readjusting her sleep and wake pattern to a regular bedtime between 11pm-midnight and getting up between 6-7am irrespective of the amount of sleep achieved.

She was made aware that initially this strategy could actually worsen her overall sense of poor daytime functioning. She was provided with a letter for the university to explain her current situation.

She also had a reassessment by a psychiatrist for both the substance use as well as depression, which have been an issue since at least the age of 14.

Six months after the first encounter her sleep pattern was improved as well as her daytime functioning.

This is an example of insomnia due to at least 3 important issues. The first is a typical example of how substances that are in common use such as caffeine, other caffeinated soft drinks, heavy use of chocolate, tea and similar, can affect sleep. Different people respond differently to the effect of caffeine. However, caffeine in the amount as described in Francesca's case invariably disturbs the continuity of sleep with recurrent awakenings through the night. The effect of caffeine can last up to 12 hours and in some predisposed individuals even coffee at midday can affect sleep. It is also true that there are people who can safely take caffeine in the evening with no apparent significant effect on their sleep.

The use of recreational drugs such as cannabis is also a major problem. Chronic daily cannabis (two or more cones per day) tends to reduce the total amount of sleep and also reduce a certain stage of sleep such as REM (rapid eye movement). Importantly cannabis effect can last up to 6 hours after consumption. Sleep is even more disturbed upon withdrawal from cannabis. Similar considerations can be applied to people who regularly use amphetamine or cocaine.

Alcohol intake also causes significant fragmentation of sleep. Alcohol can promote sleep onset, but because its action is limited to 2-3 hours, the person experiences a "rebound effect" in the second part of the night with increase sleep fragmentation and overall poor sleep quality. In the case of heavy alcohol intake with alcohol dependency sleep disruption with insomnia can persists for months-years even after alcohol intake is stopped. In these cases specialist advice and team effort by dedicated health professionals is needed to provide treatment and support long term.

Insomnia, anxiety and panic attack

John is a 32 year old rugby league player who presented with a complaint of fogginess

and heaviness in his head when he wakes up, which persists during the day causing difficulty with his studies at the university. He complains of episodes of waking up in the first two hours after falling asleep with a sensation of not being able to breathe, palpitations and a sense of tightness in his chest. He also complains of a sensation of uneasiness/soreness and tightness in the back of his throat.

John had been seen in the past for difficulty initiating and maintaining sleep at the time when his sporting career was towards the end. He has been a player mostly at local level and he found himself with no other skill apart from playing. That had caused some degree of depressed mood and anxiety and he had to resort to living with the family. He engaged himself in a bridging course at university with the intent of enrolling in a teaching career.

In retrospect he had difficulty initiating and maintaining sleep going back to the age of 13-14 after the death of his grandmother. He was very close to her and the death was loaded with significant emotions. The event was important enough to be still present and vivid in his mind.

He described a sleep pattern suggestive of mild delayed phase going to bed between midnight-1am and falling asleep in a variable amount of time but usually less than an hour. Over the last month almost on a nightly basis he would find himself awake about an hour or so after sleep onset with shortness of breath, chest tightness, and palpitations. He has no history of heartburn and oesophageal reflux. He is a very fit young man with no features suggestive of sleep apnea. Both sleep apnea and oesophageal reflux can be associated with waking up with a choking sensation.

Because of the waking up with shortness of breath and palpitations he had gone through a cardiological examination including exercise stress testing, which was normal. An overnight oximetry, which measures oxygen through the night while the person is asleep, suggested no evidence of disturbed breathing (no sleep apnea).

However John admitted drinking 6 or more caffeinated beverages per day. This amount of caffeine can on its own cause difficulty with sleep, in particular "light" sleep and frequent waking up through the night.

John's presentation is very much in keeping with anxiety disorder with panic attacks as well as a mild degree of delayed sleep phase syndrome. Because the problem has been present intermittently for a few years there was also an element of psycho physiological insomnia (see Chapter 2) with a strongly negative association between bedroom and bedtime.

Over the previous few months John has tried to exclude any potential somatic ("body") reasons for his symptoms, which have led to extensive blood testing as well as cardiological investigations as mentioned above.

There was a good discussion with John regarding how anxiety causes a state of hyper-arousal, which is not conducive to sleep (see chapter 00 pg 00). We discussed the relevance of his daytime function to his sleep. Particularly John displayed an element of poor self-esteem and a recurrent pattern of failures both in his playing career as well as at school. It was suggested he maintains a regular bedtime and regular

wake-up time. He was requested to undertake relaxation and meditation at least twice a day. He was also started on an anti-anxiety medication called alprazolam (Xanax®) ½mg half an hour before going to bed. He was warned of the possibility of mild sedation in the morning due to the medication, although rare. Given his level of anxiety the use of an anti-anxiety medication was felt to be an important part of the treatment. He was also advised to reduced the caffeinated beverages to less than 3 a day and avoiding them altogether after 3 pm.

About 6 weeks after the first encounter he found that his sleep was more regular with no waking up with shortness of breath or choking sensation. He was still concerned about not feeling fully clear of the fogginess and heaviness that had been one of his concerns but his academic record was improving.

At further follow-up appointments he was still concerned about the possibility of something "significantly wrong" with his body but he admitted that there was an improvement.

Now with a more stable sleep and wake pattern and with the beneficial effect of the anti-anxiety medication he also started psychological counselling to try to reassess the origin and the perpetuating factors of his anxiety disorder.

Comment: This is an example of how sometimes difficultly initiating and maintaining sleep and the sensation of poor daytime function can be associated with significant anxiety disorder as well as panic attack. Contrary to what people often think, panic attacks can start while the person is asleep and are not just a feature of the awake person. In this case the use of an anti-anxiety medication was needed given the high level of hyper arousal. The medication can be continued while the person is going through a counselling treatment (such as cognitive behavioural treatment for anxiety) and then can be slowly tapered off. As is often the case there was also an element of mild delayed sleep phase and psycho-physiological insomnia that improved once the level of anxiety was reduced and the sleep and wake pattern was maintained regular.

The number of caffeinated drinks (coffee, tea, chocolate, coke and other soft drinks) should also be noted. The effect of caffeine varies from one person to another, but in someone like John with difficulty initiating and maintaining sleep, reduction in the amount of caffeine, or complete cessation, is an important part of treatment.

Paradoxical insomnia (sleep mis-perception)

Anthony is a 55-year-old teacher who reports a history of difficulty initiating and maintaining sleep of more than 20 years duration. Symptoms have been fluctuating in time but over the last 12 months the insomnia has become significant enough to interfere with his daytime teaching. He reports a decrease in the ability to concentrate and some mood changes that have been of concern to him.

Anthony is a smoker of about 20 cigarettes a day and is on no caffeinated beverages. He has a history of heart burn but he is on no regular medication. Anthony divorced about 5 years ago and over the last 2 years has had a few relationships that only lasted a few months each time.

He described going to bed between 11pm-midnight. It would take at least 2 hours to fall asleep but he reported at least 2-3 times a week he would not sleep at all. He would eventually get up between 7.30-9am depending on the day of the week and would feel exhausted. He does not take naps through the day. Although he feels tired and foggy he does not fall asleep in unusual circumstances. More specifically he is not drowsy driving, visiting people, at the table or talking to people. Although he has felt tired while teaching he has never fallen asleep or felt drowsy in class.

On examination he denies having a depressed mood. The K10 (Kessler Psychological Distress Scale) showed mild anxiety. He appears to be over concerned about the effect of lack of sleep on his immune system and his health. He was worried of the lack of sleep affecting his job as a teacher.

Anthony underwent an actigraphy which is a small watch-like instrument worn on the non-dominant arm over a period of 1 to 2 weeks. This instrument gives us an indirect view of the person's sleep and wake routine. The actigraphy showed a fairly regular rest and activity pattern usually going to bed about midnight and getting up around 7.30am. However, Paul was convinced that during the period of sleep shown by the actigraphy he was actually lying in bed not moving but fully alert.

The finding on the actigraphy as well as the dramatic degree of symptoms (not sleeping at all 2-3 times/week), together with the lack of any daytime sleepiness in this case is strongly suggestive of paradoxical insomnia (subjective insomnia). With that in mind a full overnight sleep study with EEG (electro-encephalogram) monitoring was performed. In the morning Paul felt that his sleep was as usual with perhaps no more than 1 hour of sleep through the night. The sleep study showed that the patient fell asleep within 20 minutes of turning the lights off and that he slept for 7 hours and 30 minutes out of 8 hours and 20 minutes of recording.

This is diagnostic of sleep misperception. In this condition there is a significant discrepancy between how the person perceives sleep compared to objective measure of sleep by brain wave activity.

Sleep misperception (paradoxical insomnia) is a poorly understood condition that is also difficult to treat. More recent investigations looking in detail at the structure of brain wave activity suggest that the person with paradoxical insomnia has some 'awake wave' overriding sleep. It is hypothesized that this may lead to "sleep without resting" and this explains the sensation of not having slept at all on waking up in the morning. In this situation however, because sleep has actually occurred the person is not sleepy during the day even though they feel not well functioning.

Treatment of this condition is difficult. The first step was to explain to Paul that he was actually getting enough sleep. This tends to re-assure the person that health is not at risk. On occasion the use of anti-anxiety medication such as benzodiazepine ("Valium™" like medication) can be beneficial in changing the perception of sleep. However the response to treatment is usually limited. It was important for Paul to realize that although his perception of sleep was poor, he actually got sufficient sleep and that was reassuring in terms of the potential risks associated with lack of sleep.

Insomnia and depression

Rebecca is a 29 years old mother of a 4 year old daughter. She works part time as a dental assistant. She has no alcohol intake. She does not drink caffeinated beverages. At the time of assessment she was on mirtazapine (Avanza™) 30mg at bedtime and propanolol (Inderal™) for prophylaxis for migraine.

She described insomnia with difficulty initiating and maintaining sleep starting around the period of her pregnancy and retrospectively she had postnatal depressive illness, which was not recognized as such at the time. There was an element of anxiety with panic attacks.

About 12 months after the onset of her symptoms she was started on an antidepressant that brought about partial improvement in her symptoms during the day but insomnia persisted.

Rebecca is a local person who described her upbringing in negative terms, mostly in terms of traumatic experience with her father who was a heavy drinker and although he never physically abused the children, he was violent to her mother. Sarah eventually left home around age 19 to live with her current husband. However, after 5 years of living together they separated and she went overseas by herself. She came back 12 months later and they restarted their relationship, but then separated a second time when she went to live in Darwin for about 2 years. After coming back the couple got back together and they settled down in their own home. Soon after the birth of her daughter she felt depressed with increased headache. It was her view that most of the difficulty with sleep started at that time which would be in keeping with insomnia associated with postnatal depression that persisted intermittently up to this presentation.

On the DASS scale (depression, anxiety and stress score) she scored high both in anxiety and depression.

Reviewing her sleep diary, which she kept for a week, she was going to bed between 9-10pm and it would take at least 2 hours to fall asleep. After having fallen asleep she would wake-up up to 2-3 times per night up to 20 minutes each time. She would eventually get up between 8.30-9am and feel unrefreshed. She felt tired during the day but not sleepy as such.

We had a good discussion with Rebecca regarding the importance of depression in the origin of difficulty initiating and maintaining sleep. Over a period of 3 years of intermittent difficulty falling asleep and only partial benefit from the use of antidepressant and psychotherapy, an element of psycho physiological insomnia was also present with the sense of hopelessness in terms of being able to achieve a good night's sleep.

Rebecca was encouraged to reassess some of the issues around her marriage and relationship with her husband, which, from the previous history, seems to have been somewhat difficult. The need for cognitive behavioral therapy for her depressive illness was considered useful. She was left initially on the Avanza™. It was explained that

Inderal (used for prophylaxis of migraine) would also have a potential detrimental effect on Melatonin and an alternative for a prophylaxis for migraine was suggested.

Specifically as far as sleep is concerned she was requested to maintain restriction of time in bed between 11.30pm-6.30am irrespective of how much sleep she was getting. She was also started on Melatonin 3mg between 8.30- 9pm (approximately 2½-3 hours before intended bedtime). She was encouraged to see her symptoms within a 24-hour context and we stressed the importance of addressing some of the daytime issues.

She was reviewed about 6 weeks after the implementation of the above strategy and the sleep quality was much improved with only occasional awakening through the night. The level of daytime tiredness had improved but not completely lifted. She was encouraged to continue reviewing objectively some of the issues that have been relevant in the past. The Melatonin was stopped at the time of the second review but she was encouraged to maintain a very regular bedtime around 11-11.30pm and regular get up time between 6-6.30am.

In this case insomnia was certainly triggered by depression that initially went unrecognized as is sometimes the case. In fact symptoms of insomnia may occur even 12 months before depression becomes fully manifested. Even when the postnatal depression as such had lifted, however, insomnia persisted due to psycho physiological mechanism (the learned negative association between bedtime, the bedroom and sleep).

This is a good example how, although insomnia can be a symptom of depression eventually it can become an issue in its own right, which in medical terms is described as *co-morbid insomnia*. The practical relevance of this observation is that often insomnia does not lift once medication and/or psychotherapy or both improve the depressive symptoms. Therefore insomnia needs attention on its own right together with the other strategies that are helpful to improve either depression or anxiety.

It is also important to know that insomnia can occur weeks or months *before* other symptoms of depression are apparent. It can also be the first symptom of relapse in depression after improvement from it.

Insomnia and sleep apnea

John is a 39 year old gentleman who presented with a history of difficulty maintaining sleep present over the previous 3 years. He has a background of high blood pressure for which he is on medication. He consumes 7-8 standard drinks a week and no caffeinated beverages.

He normally goes to bed between 8.30pm-midnight and would fall asleep quickly within 10 minutes but he wakes up recurrently through the night. He is a heavy snorer with a history of stopping breathing reported by his wife. The history and examination are strongly suggestive of sleep apnoea as the probable reason for his difficulty to stay asleep. A formal sleep study showed that Paul had 88 episodes of stopping breathing/hour (normal less than 5/hour) with marked lack of oxygen through the period of sleep.

The importance of weight reduction was discussed but there was the need for immediate treatment. He was started on nasal CPAP (nasal continuous positive airway pressure), which consists of a small nasal mask, or prongs, which create a pressure gradient across the airway, and keeps the airways open promoting regular breathing. The treatment had a remarkable effect on the quality of sleep. Paul was able to sleep through the night with no awakening and feeling much refreshed in the morning. The degree of daytime tiredness and sleepiness improved. Given his young age the importance of weight reduction and undertaking regular physical activity every day as well as dietary manipulation was explained as long term management.

This is an example of how sleep disorders such as sleep apnoea can be associated with symptoms of insomnia. In a case like Paul's the history and examination are usually sufficient to suspect sleep apnoea. In other cases only after a full sleep study investigation it is possible to recognize the problem.

Insomnia and restless leg

Maureen is a 67 years old lady who had been referred with a history of difficult initiating and maintaining sleep, which had been present since her early thirties. She suffered postnatal depression at the time of the birth of her first child and she had anxiety and panic attack at the same time. She was treated with benzodiazepine, which after a few years she stopped of her own accord.

In the last 3 years Maureen reported more difficulty starting sleep mostly related to an uncomfortable sensation involving her calves and her thighs when she starts settling down in the evening to go to sleep. She described the sensation as a tension, sometimes as a soreness involving both calves. She feels the urge to move around which tends to relieve the unpleasant sensation for a few minutes. The discomfort is not described as a pain as such, however. She recalled similar symptoms many years before during her pregnancy, which subsided spontaneously after the birth of her child.

She goes to bed 10.30-11pm and it can take up to 1-1½ hours to fall asleep mostly because she has the need to get out of bed and walk around the room to relieve the discomfort in her leg. She finds the sheet covering her leg unpleasant to bear and she prefers having her leg exposed to the cool temperature of the room, which seems to relieve the symptoms at times. She snores intermittently but her husband does not report any stopping breathing. However, her husband reported frequent kicking of her legs in bed. He described it as if she is 'riding a bicycle' and sometimes being 'kicked all night'. The leg movement appears to be intermittent and not every night.

She wakes between 6.30-7.30am feeling only partially refreshed. She can be somewhat drowsy during the day and she can fall asleep in the morning or afternoon if not busy.

Her current medications include blood pressure medication and an antidepressant (Effexor™).

Recent investigations revealed normal blood testing including normal iron levels. Iron deficiency is a common reason for restless leg syndrome.

In Maureen's case the difficulty initiating and maintaining sleep seems likely to be related to two possible issues.

Depression
Restless leg and limb movement disorder during sleep.

However, depression appears to be well controlled on current medication and the symptoms over the last 2 years are more in keeping with increasing restless leg. Her husband's description of 'kicking at night' strongly suggests limb movement disorder, in particular leg movement disorder. The condition is often associated with restless leg and made worse by most antidepressants such as the one Kerry is on.

Maureen did not undergo a sleep test, as the history was sufficient to make the diagnosis. She was started on Sifrol™ about on2 to 3 hours before going to bed with complete resolution of her symptoms as well as reduction in any movement at night.

Restless limb syndrome refers to the sensation of tension, tenderness (sometimes of actual pain), which can involve the legs (usually) but sometimes also the arm, head and trunk. The person may describe it as a creepy crawly sensation involving the calf and the thigh. Symptoms of restlessness usually occur at a particular time of the day usually in the evening, made worse by sitting quietly or when the person tries to quiet down to go to sleep in bed. Typically the sensation of restlessness is relieved by moving the legs around in bed or walking around the room.

Restless leg syndrome is a common complaint as we get older and an important cause of insomnia, both difficulty falling asleep and staying asleep. It often causes poor daytime function with fatigue, sleepiness and depressed mood. Memory and concentration can also be affected.

Patients with restless leg syndrome often have a family history of it suggesting there is a genetic predisposition. Among the reversible factors for restless leg iron deficiency is probably the most common one. In certain conditions such as long-standing diabetes or chronic kidney failure, restless leg can be associated with chronic damage to the nerve endings (called neuropathy). Vitamin B12 deficiency and other nutritional deficiency are also possible causes of restless leg syndrome.

As in Maureen's case restless legs syndrome is common in pregnancy, in particular in the last trimester. It resolves in the majority of mothers after delivery with no need of any intervention.
People with spinal and lower back injury are also more likely to develop restless leg and periodic leg movement during sleep.

The use of certain medications can aggravate the restless leg. Most anti-depressants, both old and new, (for example amitriptyline, mirtazapine), anti-hypertension calcium channel blockers (for example nifedipine), excessive alcohol and caffeine make restless leg syndrome worse.

Treatment using simple self-help measures can be sufficient in mild cases. Stretching, relaxation exercises and massaging of the affected limb can lessen the discomfort. Cooling the legs by sleeping uncovered or by blowing a fan can be of help.

When simple interventions are not sufficient other treatment options for restless leg and limb movement disorder involve iron replacement in people who have iron deficiency or even low iron levels. Medications that can be used successfully include anti-Parkinson drugs, particularly the new generation (pramipexole, Sifrol®, ropinirole, Reprive®). However after a few weeks/months of using anti-Parkinson medications a side effect called *"augmentation"* may occur. It refers to progressively early onset of the restless leg symptoms in the evening, sometimes early afternoon, increase in the severity and spread of the restlessness to other part of the body (for example to the arms). The re-occurrence of restlessness in the morning when the person wakes up is also an unwanted side effect, called *"rebound".* These problems can be corrected by reducing the amount of medication or changing to a different treatment. In these cases close consultation with your doctor is necessary.

A rare side effect also warrants attention. Medications which increase the activity of dopamine (*anti-Parkinson medications*) can be associated with compulsive behaviour such as gambling, something to be aware of, given the potentially damaging effect of such activity.

The use of long acting opioids (morphine and morphine like medications) is also very effective. Clinical experience suggests that dependence and tolerance (the need to increase the dose over time) do not occur. This is important to know, as people are often concerned of using morphine long term. Some health practitioners use opioids only in severe cases.

The reason why iron replacement, anti-Parkinson medication and opioids are effective is thought to be their role in the "dopamine system" in the brain. Dopamine is one of the important molecules that regulate the motor system, which is believed to be malfunctioning in restless leg and periodic leg movement in sleep.

The use of benzodiazepine, derivatives of Valium™ such as temazepam or clonazepam (Rivotril™) can also be successful. In patients with neuropathy (chronic damage to the nerve endings) usually associated with diabetes or chronic renal failure, the use of other medications such as Gabapentin (an anti-epileptic medication) can be useful.
Generally in these situations a thorough discussion with your GP or a sleep specialist is advisable before starting any of the above treatments.

Insomnia and non-restorative sleep

Mrs. Kim is a 55 years old with a history of difficulty initiating and maintaining sleep starting in her mid twenties. She works full time in a local health service. She is happily married with a 34 years old son. She has no significant problems at home. The work environment is somewhat stressful but nothing is of a major concern. She is the eldest of four siblings and she describes her upbringing in very positive terms. The husband has often been away working and when she has been by herself the difficulty

initiating and maintaining sleep has been more difficult than at other times.

She normally goes to bed around 10pm but it can take up to 1 hour to fall asleep. She can wake up through the night, but not every night. There is no history of snoring or restless leg syndrome. She normally gets up at 5am to go walking with friends, otherwise she gets up between 6.30-7am and she feels constantly unrefreshed.

Robyn was not anxious or depressed. She had a normal examination and a low probability of psychological distress on the K10 scale (Kessler Psychological Distress Scale, see Appendix).

The possibility of psycho-physiological insomnia (a learned pattern of poor sleep over a long period) was considered. She was on a beta-blocker (a medication used for the treatment of hypertension which tends to suppress Melatonin). We discussed the strategy of restriction of time in bed and the use of Melatonin. This was implemented over a period of 6 weeks but Mrs. Robyn had no significant benefit from this strategy.

At that stage an overnight sleep study at home was carried out. The sleep study showed the Mrs. Robyn fell asleep within 9 minutes of turning the lights out. She slept for 6 hours 40 minutes out of 7 hours in bed. There was no snoring and no sleep apnoea. When she woke in the morning, however, she felt unrefreshed and felt tired during the day, as she has been complaining for a long time.

After discussion with Mrs. Robyn treatment with zolpidem (Stilnox®) slow release 6.25mg about half an hour before going to bed was implemented with much improved sleep quality and sense of good sleep in the morning. Treatment was continued for about 3 weeks and then the medication was reduced to once every second day maintaining significant benefits in terms of her perception of sleep.

This is not an uncommon situation where, although sleep study would suggest a fair amount sleep, the person' perception is one of poor sleep quality overall or *non-restorative sleep*. In this situation the use of sleeping tablets may be beneficial in some patients like in Mrs. Robyn's case and the intermittent use of a sleeping tablet (see table 2 page 00) seems to be appropriate in improving the person's quality of sleep.

Non-restorative sleep is considered a particular form of insomnia where a person's main complaint is not so much difficulty initiating sleep and /or staying asleep but rather a sensation of not feeling refreshed on waking up even when the amount of sleep seems adequate. In non-restorative sleep overnight sleep study is often unremarkable. Assessment of other medical problems such as iron, vitamin deficiency or celiac disease (intolerance to gluten) should be undertaken. Eventually once medical and other sleep disorders are excluded, treatment with sleep promoting medications can be tried.

Chapter 4

Practical Advices

Implementing restriction of time in bed

A healthy sleep pattern consists of sleeping more than 85% of the time spent in bed. This is referred to as sleep efficiency (sleep time/time in bed). For example a person who goes to bed at 9pm, takes an hour to fall asleep, is awake twice in the middle of the night for an hour each time and gets up at 6am has an efficiency of 66% (6hrs of sleep /9 hrs in bed). This person is spending a long time in bed awake. We want to restrict the time the patient spends in bed to achieve an efficiency of > 85%. I would recommend an 11.30pm bed time and get up time at 6am (6/6.5=92%). Note that it is easier to delay bed time than to anticipate wake up time, even though both can be changed. This is continued for 10 days to 2 weeks.

You need to *be aware* that daytime tiredness (one of the main complaint the person has) is likely to worsen while implementing restriction of time in bed. This is to be expected because initially the pattern of disturbed sleep will continue. However after 10 days or so the amount of lack of sleep built up progressively to a point when sleep continuity starts to improve. You will notice falling asleep quicker and if sleep is interrupted in the middle of the night sleep, it resumes quickly. If that is happenings bed time can be moved 15-30 minutes earlier, and continue for further 10 days to 2 weeks. The process is repeated until the expected amount of sleep is achieved or sleep starts being fragmented again. This will happen if the time in bed has become too long again, and it signals the need to restrict time in bed again. In practice this means going to bed at a later time.

The importance of maintaining regular bedtime and get up time

You need to keep bed time at the same time and keeping get up time unchanged including day off work. A common objection, particularly from young people, is that restriction of time in bed interferes with their social activity on weekends, when they do not go to bed till the early hours of the morning and sleep in until midday. You need to understand that during the 4 to 6 weeks of treatment it is desirable to avoid extreme behavior. However if that cannot be avoided it is important to maintain an early get up time. In the example above (bedtime 11.30 get up 6) if the person stays up until 4am, he still need to get up at the latest by 8am. He will be poorly functional that day but the “body clock” will catch up the following night. This is essential in people with delayed sleep phase (page xx). Instead if they sleep in until 12Md the benefits obtained by the restriction of time in bed tend to be lost.

If you find implementing restriction of time in bed too difficult, you may modify your strategy by using "compression" of time in bed. In the previous example (bed time 11.30pm, get up 6am) you may go to bed at 10.30pm for a week, 11pm for another week and then 11.30pm. The process will take longer but may be better tolerated.

Another option to "ease" the person into the program is to allow a sleeping tablet every night for the first week, every second day for the second week and then stop. You need to discuss this option with your family doctor.

You need to be aware that, when the sleeping tablet is stopped, sleep will deteriorate to some degree. This is however temporary and will improve. The awareness that sleep quality is likely to deteriorate, once the sleeping tablets are stopped, will minimize the tendency to continue their use.

Avoid napping through the day. Although napping in the afternoon (between 1pm and 4pm, the "siesta") is a universal phenomenon seen in all ethnic groups and in any country, when we try to manage insomnia naps are best avoided.

Use of light in insomnia

There are two important pieces of advice in regard to light.

First, darkness (lack of light) is a very important cue to prepare our body to sleep. We need to avoid light in the evening, including light from the television set and computer to help our body to settle for sleep. This is often more easily said than done as our life style revolves around the television and a variety of Internet communication. Nevertheless in particular if there is insomnia avoiding light in the evening is important. Light tends to delay melatonin secretion, which in turn delays our body's readiness to fall asleep.

In shift workers, following a night shift, a dark room is essential to maximize sleep during the day. For the night worker it is also important to minimize light exposure after 4-5 am by the use of dark glasses, for example driving home in the morning.

Second, exposure to bright light after waking up, such as natural light on a cloudy day or shadow area on a sunny day, helps synchronize our body clock and promote sleep onset earlier the following evening. The use of artificial light (light boxes, preferably blue light) can be beneficial (see page 00 chapter 2).

Physical exercise

Regular exercise has many health benefits including sleep promotion. However some advice should be noted. *The time of exercise* should be similar each day and away from bed time (at least 3 hours before). Exercising at the same time each day helps synchronize our body clock contributing to a stable sleep and wake pattern.

Exercise should be moderate because heavy physical activity is detrimental to sleep. Sometimes people try to exercise to exhaustion in the false idea that being "dead tired"

helps falling asleep. It is exactly the opposite. For the body to deal with excessive effort it needs to activate our stress system (page xx) and this is not conducive to sleep.

Exercising at the expense of resting time is also not advisable because it only leads to increased tiredness due to lack of sleep. It is not uncommon in our society for people to try to fit exercise into an already busy schedule. People may wake up one or two hours earlier than they would otherwise in order to fit a gym session or running session. In the long run this practice may be counterproductive leading to chronic tiredness.

The use of a sleep diary

The use of a sleep diary for one or two weeks is useful at the very beginning of treatment, ideally before you start restriction of time in bed and for one week after six to eight weeks of intervention. However, it is *not advisable* to keep a diary *during* restriction of time in bed. Sleep/wake should not be assessed on a daily basis but seen in the context of the person's function over an extended period of at least 3-4 weeks. Keeping a diary every day often leads to an increased level of anxiety regarding sleep and should be discouraged.

What about sleep hygiene and stimulus control?

When people with insomnia use self help books often they are faced with a list of do's and don'ts which goes under the name of sleep hygiene and stimulus control (see below).

Sleep hygiene and stimulus control

1. Go to bed only when you are drowsy.
2. Keep bedtime and wake-up regular irrespective of how much sleep you have achieved.
3. If you are awake in bed for more than 15-20 minutes leave the bedroom and engage in a boring activity.
4. Return to the bedroom only when you are sleepy.
5. Use the bedroom only for sleep (and sex) but avoid reading, listening to music or watching TV in bed.
6. Avoid caffeinated beverages in the afternoon.
7. Avoid alcohol late at night
8. Limit/avoid naps.
9. Avoid exercise late in the evening/avoid nicotine and excessive alcohol late at night.
10. Keep the bedroom dark at a comfortable temperature and minimize noise.

Sleep hygiene suggestions and stimulus control needs to be understood and applied to the individual person. More specifically *not all* the prescriptions apply to one individual.

For example some of the recommendations are straightforward. "Avoid going to bed

until drowsy" does not need an explanation. Sleep is a physiological process that has its own rhythm and is mostly outside our own will. We can certainly help sleep onset provided that a regular sleep and wake pattern is maintained.

Avoidance of caffeinated beverages or any stimulant during the day applies to most people; however, there is a high variability between individuals. Some people can take a coffee before midday and this appears to affect sleep; others can have a cup of coffee just before going to bed with no ill effect. It seems reasonable that if a person has insomnia, particularly difficulty initiating and maintaining sleep, they should limit the intake of caffeinated beverages be it coffee, tea, soft drinks with caffeine perhaps to less than 2 a day and if at all possible abstain completely. However complete abstinence in the long run may not be practical or easy to achieve.

Avoiding cigarette smoking or alcohol particularly if in excess of course is to be recommended. Avoiding exercise late at night is not conducive to sleep. Particularly vigorous exercise in the 3 hours before going to bed tends to increase body temperature and this would be an obstacle to falling asleep. Making sure that the bedroom is comfortable, quiet and dark, will of course favor sleep.

Limiting napping can be applied particularly if the person has difficulty maintaining sleep. However, napping early in the afternoon is a natural tendency. What should be avoided is napping in the evening hours while watching television. A nap of 10-20 minutes at 7-8pm interferes with sleep onset.

Other measures which go under the description of stimulus control need to be adapted to the individual. A typical recommendation for stimulus control is to avoid reading and watching television in bed. There is an element of truth in these recommendations. As explained in the previous chapter it is important for the bedroom and bed time to be re-established as something that the person is looking forward to and not an anxiety raising situation. However, there is nothing wrong with reading in bed if reading in bed is a way of relaxing and is an enjoyable activity. The person can read and then when ready can simply turn the lights off and go to sleep. By the same token listening to music is quite appropriate for some individuals. Even watching television is also something that is enjoyable and allows the person to relax and switch off from the worries of the day. One possible strategy is to have a timer so that the television switches off after an hour or so. Leaving the television on through the night would certainly interfere with sleep and has to be discouraged.

Stimulus control also requires that if you wake up in the middle of the night and you can't fall asleep within 15-20 minutes you should get up and leave the bedroom and then return to the bedroom only when you are sleepy. This kind of practice is very difficult to implement and is usually not successful unless within the framework of restriction of time in bed as explained in the previous chapters.

So when you consider your strategy to manage insomnia use the recommendations above in the way that applies to you. You may for example use only 1 or 2 of the above suggestions, and it will be different for each individual.

The essence of chronic insomnia treatment

The essence of treatment of insomnia consists of:

Reframing the problem from "only" a bedtime/night-time issue, to a 24 concern.

Understanding how our daytime behaviour, thoughts and feelings affect our sleep is of paramount importance.

There is not a set amount of sleep that is needed. Each individual has their own need that can be any amount from 6 to 9 hours.

We need to regain control over our sleep and wake pattern so that bedtime and nighttime become again a positive experience (*"finally I can lie down and have a rest")*, rather than an anxiety-raising situation (*"I will be lying awake for hours and tomorrow I will feel exhausted again").*

We try to achieve the above objectives mostly by exploiting the natural instruments that regulate our sleep and wake function; that is the amount of time we have been awake before trying to sleep (by using *restriction of time in bed*) and the body clock (by using *melatonin and light*).

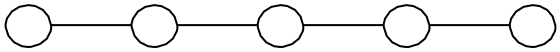
The use of sleeping tablets should be viewed like any other medication. It has its role at the appropriate time, often for short periods together with the other strategies discussed in this book. Occasionally a more regular use is necessary even though it is an uncommon occurrence.

When specific sleep disorders are present (common examples are obstructive sleep apnea, restless leg syndrome, abnormal movements during sleep), expertise from a sleep specialist is advisable. Similarly when insomnia is present at the same time as depression, anxiety, post-traumatic stress disorders, bipolar disorder, and cooperation with an expert health professional is important. This also applies when insomnia is made worse by use of substances such as excessive alcohol and caffeinated beverages, stimulants, and cannabis.

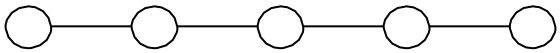
Appendices

K10 (Kessler Psychological Distress Scale)

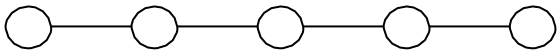
1. **About how often did you feel tired out for no good reason?**



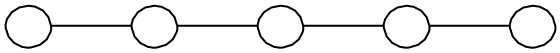
2. About how often did you feel nervous?



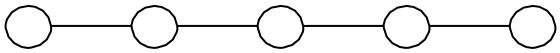
3. About how often did you feel so nervous that nothing could calm you down?



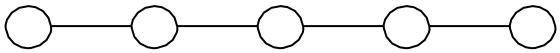
4. About how often did you feel hopeless?



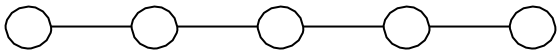
5. About how often did you feel restless or fidgety?



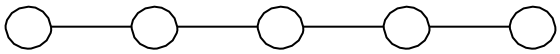
6. About how often did you feel so restless you could not sit still?



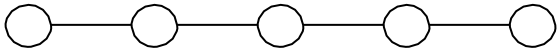
7. About how often did you feel depressed?



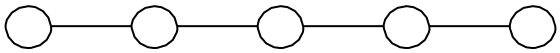
8. About how often did you feel that everything was an effort?



9. About how often did you feel so sad that nothing could cheer you up?



10. About how often did you feel worthless?



The K10 a simple measure of psychological distress. The K10 is in the public domain and is promoted on the Clinical Research Unit for Anxiety and Depression website (www.crufad.org) as a self-report measure to identify need for treatment.

The K10 uses a *five value* response option for each question – all of the time, most of the time, some of the time, a little of the time and none of the time which can be scored from five through to one.

The *maximum score is 50* indicating severe distress, the *minimum score is 10* indicating no distress.

Questions 3 and 6 are not asked if the preceding question was 'none of the time' in which case questions 3 and 6 would automatically receive a score of one.

Interpretation of the result:

10 to 19	low probability of psychological distress
20 to 34	medium probability of psychological distress
35 to 50	high probability of psychological distress

Body Clock type

DIRECTIONS: Please *check* the response for *each* item that best describes *you.*

1. Considering only your own "feeling best" rhythm, at what time would you get up if you were entirely free to plan your day?

5:00–6:30 a.m.	_____(5)
6:30–7:45 a.m.	_____(4)
7:45–9:45 a.m.	_____(3)
9:45–11:00 a.m.	_____(2)
11:00 a.m.–12:00 (noon)	_____(1)

2. Considering your only "feeling best" rhythm, at what time would you go to bed if you were entirely free to plan your evening?

8:00–9:00 p.m.	_____(5)
9:00–10:15 p.m.	_____(4)
10:15 p.m.–12:30 a.m.	_____(3)
12:30–1:45 a.m.	_____(2)
1:45–3:00 a.m.	_____(1)

3. Assuming normal circumstance, how easy do you find getting up in the morning? (Check one.)

Not at all easy	_____(1)
Slightly easy	_____(2)
Fairly easy	_____(3)
Very easy	_____(4)

4. How alert do you feel during the first half hour after having awakened in the morning? (Check one.)

Not at all alert	_____(1)
Slightly alert	_____(2)
Fairly alert	_____(3)
Very alert	_____(4)

5. During the first half hour after having awakened in the morning, how tired do you feel? (Check one.)

Very tired	_____(1)
Fairly tired	_____(2)
Fairly refreshed	_____(3)
Very refreshed	_____(4)

6. You have decided to engage in some physical exercise. A friend suggests that you do this one hour twice a week and the best time for him is 7:00–8:00 a.m. Bearing in mind nothing else but your own "feeling best" rhythm, how do you think you would perform?

Would be in good form	_____(4)
Would be in reasonable form	_____(3)
Would find it difficult	_____(2)
Would find it very difficult	_____(1)

7. At what time in the evening do you feel tired and, as a result, in need of sleep?

8:00–9:00 p.m.	_____(5)
9:00–10:15 p.m.	_____(4)
10:15 p.m.–12:30 a.m.	_____(3)
12:30–1:45 a.m.	_____(2)
1:45–3:00 a.m.	_____(1)

8. You wish to be at your peak performance for a test which you know is going to be mentally exhausting and lasting for two hours. You are entirely free to plan your day, and considering only your own "feeling best" rhythm, which ONE of the four testing times would you choose?

8:00–10:00 a.m.	_____(4)
11:00 a.m.–1:00 p.m.	_____(3)
3:00–5:00 p.m.	_____(2)
7:00–9:00 p.m.	_____(1)

9. One hears about "morning" and "evening" types of people. Which ONE of these types do you consider yourself to be?

Definitely a morning type	_____(4)
More a morning than an evening type	_____(3)
More an evening than a morning type	_____(2)
Definitely an evening type	_____(1)

10. When would you prefer to rise (provided you have a full day's work—8 hours) if you were totally free to arrange your time?

Before 6:30 a.m.	_____(4)
6:30–7:30 a.m.	_____(3)
7:30–8:30 a.m.	_____(2)
8:30 a.m. or later	_____(1)

11. If you always had to rise at 6:00 a.m., what do you think it would be like?

Very difficult and unpleasant	_____(1)
Rather difficult and unpleasant	_____(2)
A little unpleasant but no great problem	_____(3)
Easy and not unpleasant	_____(4)

12. How long a time does it usually take before you "recover your senses" in the morning after rising from a night's sleep?

0–10 minutes	_____(4)
11–20 minutes	_____(3)
21–40 minutes	_____(2)
More than 40 minutes	_____(1)

13. Please indicate to what extent you are a morning or evening *active* individual.

Pronounced morning active (morning alert and evening tired)	_____(4)
To some extent, morning active	_____(3)
To some extent, evening active	_____(2)
Pronounced evening active (morning tired and evening alert)	_____(1)

See over for scoring and results

Body Clock Type

Evening type : 22 or less

Intermediate type : 23-43

Morning type : 44 or above

Appendix

Specific Disorders of Sleep.

1. *Snoring and sleep apnoea.*

Do you snoring most nights? YES/NO

Does your spouse/partner report stopping breathing? YES/NO

Do you feel tired when you wake up? YES/NO

Do you wake up through the night with brief choking feeling? YES/NO

If you answered yes to at least 3 of these 4 questions you may have sleep apnoea and assessment by a sleep physician may be worthwhile.

Restless leg, limb movements

Do you have a feeling of discomfort, ache in your calves/thigh when you are sitting quietly or when you lay down in bed? YES/NO

Does your bed partner report 'kicking' in bed? YES/NO

If you answered yes to any of the above a formal assessment may also be worthwhile.

Abnormal movements during sleep

Do you have violent jerks at night? YES/NO

Are you a frequent sleepwalker? YES/NO

Do you act out dreams during sleep? YES/NO

Do you eat frequently through the night? YES/NO

Any of the above situations are worthwhile being investigated by a sleep specialist as they may be contributing to insomnia.

Insomnia/Daytime

Please reflect on some of these issues and how you feel about them

Are you satisfied with yourself? YES/NO

Do you have a sense of fulfillment at the end of the day? YES/NO

Are you satisfied with what you have done so far in your life

and what you are doing? YES/NO

Do you have a sense of direction and plan for the near future? YES/NO

……..

……..

Are you satisfied with your personal relationship?

Spouse YES/NO

Close friend YES/NO

Children YES/NO

Family members YES/NO

Are you satisfied with your job/occupation and how you spend your day?

YES/NO

……

……..

If you think of your family life as a young child and a young teenager:

How was your upbringing?

Was it happy and safe?

Did you feel insecure or threatened?

Did you have a close relationship with your parents? Siblings?

How was your school environment?

Was it friendly? Did you feel discriminated?

Was there any bullying?

(con.) Daytime issues

Issue	**Satisfied (yes) (no)**	**Problem**	**What can be done and how**
Parent/Parents			

Spouse			
Child\Children			
Step children			
Step relatives			
In laws			
Pets			
Neighbors			
Home environment			
Community			
Occupation			
Boss at work			
Colleagues at work			
Customers at work			

Study			
Lecturers			
Colleagues students			
Transport			
Money			

Glossary

Anxiolytic

Anxiolytics are medications that reduce anxiety.

Anti-coagulants.

Anti-coagulants are medications, which reduce the ability of the blood to clot. They are often used in people who have developed clots in their legs or if clots have traveled to their lungs. The most commonly used anti-coagulant is called Warfarin.

Anti-histamine.

Anti-histamines are medications, which are commonly used in allergies. Histamine is found in the brain and tends to promote wakefulness. Therefore anti-histamines are used as sleep promoting agents. They are often present in over the counter preparations.

Anti-Parkinson's medication.

These are medications, which are used to reduce the stiffness present in Parkinson's disease. These medications however are also useful in treating restless leg syndrome.

Antero-grade amnesia.

Amnesia is the lack of memory. Anterograde (forward) amnesia is the lack of memory for events, which have occurred some time after the ingestion of a particular substance. Antero-grade amnesia can also occur following head trauma whereby the person has no recollection of the few hours, or sometimes days, after the trauma.

Asthma.

Asthma is a condition caused by narrowing of the airway. Asthma tends to be worse in the early hours of the morning (3.00-4.00am). If poorly controlled it is a common cause of disturbed sleep and can lead to insomnia.

Benzodiazepines.

Benzodiazepines are a group of medications, which were initially used as anti-anxiety agents but were found to also promote sleep. The best known of the Benzodiazepines is diazepam (Valium™). However, there are many other Benzodiazepines. In common use is Temazepam, which tends to have a shorter duration of action than Valium™ and is therefore more useful as a sleep-promoting agent.

Circadian rhythm.

This refers to body rhythms, which changes on a 24-hour (circadian) basis. Most of the functions in the body do not remain at the same level through the day. The body function tends to increase with periods of peak activity and then to decrease with periods of lower activity over 24 hours. A typical example is the blood pressure, which tends to be highest around 4.00pm and lowest at around 4.00am. Many other functions display a 24-hour (circadian) rhythm.

Cognitive Behavioral Therapy (CBT)

CBT is a treatment aimed at changing our behavior (the way we function) through re-adjusting the way we think about life issues. It is based on the basic idea that our behavior is dictated by what we think and the emotions associated with our thoughts. Cognitive behavioral therapy therefore is applied to a variety of possible problems, for example phobias, anxiety and, of course, chronic insomnia.

Erythromycin.

Erythromycin is an antibiotic. The concurrent use of Erythromycin and Imovane™ can interact with each other and may increase side effects of Imovane™, in particular metallic taste.

Heart failure.

Heart failure is a condition of decrease in the hearts capacity to pump blood. This often results in building up of fluid within the lung, which is made worse when the person is lying in bed. If heart failure is not controlled it can lead to disturbed sleep and insomnia.

Hyper-arousal.

This is a state where the body is constantly alert and therefore does not favor sleep onset.

Hypnotic.

This is a medication which promotes sleep (hypnos = sleep).

Lupus.

Lupus is an immunological condition, which is characterized amongst other symptoms, by joint swelling and pain. If not properly controlled this can lead to disturbed sleep.

Melatonin.

Melatonin is a hormone produced by the pineal gland (figure 1). It tends to increase in the body at nighttime promoting sleep onset and it tends to be very

low during the daytime. It is an important hormone to regulate our sleep and wake cycle.

Obstructive sleep apnoea.

Obstructive sleep apnoea is the combination of snoring and stopping breathing (apnoea) during sleep. It is a common condition due to floppiness of the airway, particularly the tongue and soft palate which tend to collapse at the back of the throat causing obstruction to breathing.

Esophageal reflux.

Esophageal reflux is the back run of fluid from the stomach into the gullet, which is due to a poor functioning valve at the bottom of the gullet. It is often associated with sensation of burning in the chest (heart burn), however one in five people may have reflux without any symptoms.

Osteoarthritis.

This refers to degeneration of the joints. Of particular importance in sleep is degeneration of the neck, lumbar and lower back bones, shoulder and knee. Osteoarthritis causes pain, which often tends to disturb sleep.

Osteoporosis.

Osteoporosis refers to lack of calcium in the bones, which can lead to fractures. Osteoporosis can also cause pain, which disturbs sleep.

Opioids.

Opioids are medications that control pain. The most commonly used include Codeine, Morphine and Methadone. They are often used in restless leg syndrome as well as to control chronic pain.

Oximetry.

This is a simple test that can be performed at home whereby the oxygen of the person is monitored through the night while the person is asleep. If there is stopping breathing the oxygen tends to drop which is recorded by the instrument. It is a simple way to screen for obstructive sleep apnoea.

Paracetamol.

Paracetamol is a common medication used to control pain and also to reduce body temperature.

Prophylaxis

Prophylaxis refers to strategies, which may include medications (or vaccinations for example) taken in order to prevent the occurrence of symptoms or diseases.

Prostate problems.

An enlarged prostate can lead to recurrent awakenings to void through the night and it is a common cause of waking up through the night.

Restless leg syndrome.

Restless leg syndrome is a condition characterised by uncomfortable sensation in the calf and in the thigh, sometimes frank pain. The person has the urge to

move to relieve the unpleasant sensation. It is a common condition particularly in the older population.

Rheumatoid arthritis.

This is degeneration of the joints due to an abnormal immune system response. Rheumatoid arthritis is often associated with restless leg syndrome and if the pain is not controlled can lead to disturbed sleep and insomnia.

Sleep misperception.

This is a situation where the person perceived having slept less than a sleep study (an objective measure) shows. Sleep misperception is often present in people who suffer from chronic insomnia.

Sleep study

Sleep study usually refers to monitoring of the body function during sleep. This is often includes the monitoring of brain activity (electroencephalogram), muscle activity, breathing, heart activity with electrocardiogram and oxygen level.

Stage of sleep.

Through the night sleep changes with different levels of depth, which are classified as stages N1, N2, N3 (N= Non-REM) and a special stage called R for REM (rapid eye movement). Sleep stages are used to described how sleep develops through the night.

Supra-chiasmatic nucleus.

This is a deep-seated part of the brain, which is responsible for regulating our body clock (see figure