Colin Espie is Professor of Clinical Psychology and Director of the University of Glasgow Sleep Centre. He has published over 200 research papers on insomnia and is a leading member of the American Academy of Sleep Medicine and the European Sleep Research Society.
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OVERCOMING INSOMNIA

A self-help guide using Cognitive Behavioral Techniques

COLIN A. ESPIE

ROBINSON
London
To Aud: my wife and my soulmate
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Acknowledgements

I would like to thank a number of people who have made a major contribution, in various ways, to the work underlying this book. There are far too many to mention by name, but I hope that by summarizing I can adequately reflect my very sincere gratitude.

First of all I am grateful to the many research colleagues I have known and worked with over the years in Canada, the USA, Australia, Europe and, of course, in the UK. The development and evaluation of CBT for insomnia has been, and continues to be, an international effort, and I have been privileged to be part of that work. Then there is my own research team at the University of Glasgow Sleep Research Laboratory; both current members of my group and those that have worked with me across the years. Scores of highly motivated research fellows, research assistants, research nurses, postgraduates and administrative staff have helped to keep the show on the road. More than that – these people have been the lifeblood of my professional life.

My personal assistant Anita McClelland deserves special thanks, not only for her typing of the drafts of this book, but also for putting up with me over the past ten years! Every productive professional has a good administrator in the background, and I would like to thank Anita for always being there to help.
None of this, of course, would have been possible without our patients and research participants, from whom we find out, through one research method or another, everything that we know about the perplexing yet intriguing disorder that we call ‘insomnia’.

Finally, I have a wonderful and supportive family of whom I am immensely proud: Craig, who is fulfilling his father’s alternative dream by studying and playing music; Carolyn, who is following in our footsteps through her studies in psychology; and our youngest, Robbie, who at five years of age is already able to take charge of most of life’s major decisions! Most of all, there is my alluring and very special wife, Audrey, to whom I dedicate this book with all my love.
Preface

I am writing this preface while on sabbatical leave at Université Laval, Québec City. I had promised myself that the book would be finished around four weeks ago, but I guess to be only a month behind schedule for an undertaking of this size is not so bad. Anyway, that’s life, is it not?

The priorities and pressures are such that most of us in academic life spend the majority of our time conducting research, analyzing data, writing scientific papers, and teaching our students. Those of us who are clinical academics also try to fit in seeing the occasional patient or two. In this context, writing books for the general public is at best regarded as a hobby; at worst even a misuse of our time. Yet what is the purpose of knowledge if it is not to share it, and to try to improve things for people?

I struggled with this dilemma for a while. However, I decided last year, after being approached by the publishers, that the time had finally come to ‘do the book!’ I am sure that other authors in the excellent CBT series that Constable and Robinson produce have probably felt the same way. I guess most of us have a lay readership book in us. Well for better or for worse this one is mine.

It has actually felt very good writing the book. It has given me the opportunity to make available to you the treatment materials that we have developed and evaluated in our
research studies. That feels like the right thing to do. What you are getting here is pretty much a complete CBT treatment guide for insomnia; the way I would present it to you if you came to my clinic in Glasgow. Of course, I can’t get the particular ‘angles’ that are special to you and to your sleep problems. However, that said, I am confident that you have a very powerful tool in your hands that will help you towards overcoming your insomnia.

I wish you success as you set out on this course of CBT treatment. Sleep soundly and sleep well.

Colin A. Espie
BSc, MAppSci, PhD, FBPsS,
CPsychol Université Laval,
Québec City, Canada
Introduction

Why a cognitive behavioral approach?

You may have picked up this book uncertain as to why a psychological approach, such as a cognitive behavioral one, might help you overcome your sleep problems. A brief account of the history of this form of treatment might be helpful and encouraging. In the 1950s and 1960s a set of therapeutic techniques was developed, collectively termed ‘behavior therapy’. These techniques shared two basic features. First, they aimed to remove symptoms (such as anxiety) by dealing with those symptoms themselves, rather than their deep-seated, underlying historical causes (traditionally the focus of psychoanalysis, the approach developed by Sigmund Freud and his associates). Second, they were loosely related to what laboratory psychologists were discovering about the mechanisms of learning, and could potentially be put to the test, or had already been proven to be of practical value to sufferers. The area where these techniques proved to be of most value was in the treatment of anxiety disorders, especially specific phobias (such as extreme fear of animals or heights), notoriously difficult to treat using conventional psychotherapies.

After an initial flush of enthusiasm, discontent with behavior therapy grew. There were a number of reasons for this, an important one was the fact that behavior therapy did
not deal with the internal thoughts which were so obviously central to the distress that many patients were experiencing. In particular, behavior therapy proved inadequate when it came to the treatment of depression. In the late 1960s and early 1970s a treatment for depression was developed called ‘cognitive therapy’. The pioneer in this enterprise was an American psychiatrist, Professor Aaron T. Beck. He developed a theory of depression which emphasized the importance of people’s depressed styles of thinking, and, on the basis of this theory, he specified a new form of therapy. It would not be an exaggeration to say that Beck’s work has changed the nature of psychotherapy, not just for depression but for a range of psychological problems.

The techniques introduced by Beck have been merged with the techniques developed earlier by the behavior therapists to produce a therapeutic approach which has come to be known as ‘cognitive behavioral therapy’ (CBT). This therapy has been subjected to the strictest scientific testing and it has been found to be a highly successful treatment for a significant proportion of cases of depression. It has now become clear that specific patterns of disturbed thinking are associated with a wide range of psychological problems, not just depression, and that the treatments which deal with these are highly effective. So, effective cognitive behavioral treatments have been developed for anxiety disorders, like panic disorder, generalized anxiety disorder, specific phobias and social phobia, obsessive compulsive disorders, and hypochondriasis (health anxiety), as well as for other conditions such as compulsive gambling, drug addiction, and eating disorders like bulimia nervosa. Indeed, cognitive behavioral techniques have been found to have a wide application beyond the narrow categories of psychological disorders. They have been applied effectively, for example, to helping people with low self-esteem, those with
marital difficulties or weight problems, those who wish to
give up smoking or excessive drinking, and, as in this book,
those with sleep problems.

The starting-point for CBT is the realization that the ways
we think, feel and behave are all intimately linked, and
changing the way we think about ourselves, our experiences,
and the world around us changes the way we feel and what
we are able to do. So, for example, by helping a depressed
person identify and challenge their automatic depressive
thoughts, a route out of the cycle of depressive thoughts
and feelings can be found. Similarly, habitual behavioral
responses are driven by a complex set of thoughts and
feelings, and CBT, as you will discover from this book, by
providing a means for the behavior to be brought under
cognitive control, enables these responses to be undermined
and a different kind of life to be possible.

Although effective CBT treatments have been developed
for a wide range of disorders and problems, these treatments
are not widely available; and, when people try to help
themselves on their own, they often do things which make
matters worse. In recent years the community of cognitive
behavioral therapists has responded to this situation. What
they have done is to take the principles and techniques of
specific cognitive behavioral therapies for particular prob-
lems and present them in manuals, which people can read
and apply themselves. These manuals specify a systematic
program of treatment which the individual works through to
overcome their difficulties. In this way, cognitive behavioral
therapeutic techniques of proven value are being made
available on the widest possible basis.

Self-help manuals are never going to replace therapists.
Many people will need individual treatment from a qualified
therapist. It is also the case that, despite the widespread
success of CBT, some people will not respond to it and will
need one of the other treatments available. Nevertheless, although research on the use of these self-help manuals is at an early stage, the work done to date indicates that for a great many people such a manual will prove sufficient for them to overcome their problems without professional help. Many people suffer silently and secretly for years. Sometimes appropriate help is not forthcoming, despite their efforts to find it.

Sometimes they feel too ashamed or guilty to reveal their problems to anyone. For many of these people the cognitive behavioral self-help manual will provide a lifeline to recovery and a better future.

Professor Peter Cooper
The University of Reading, 2005
Foreword

To be unable to sleep is one of life’s worst experiences. Insomnia not only affects your night-time, through disrupted and unsatisfactory sleep, but it also has consequences in terms of your quality of life. People with persistent sleep problems of this type often complain of being slowed down mentally or moody during the day. What is more, they are not the only ones who suffer. Broken sleep can affect partners, children, and our social life and working life.

Insomnia is a major public health problem. Billions of dollars are spent worldwide every year on prescribed medications, over-the-counter remedies, and other suggested solutions – all in the search of a decent sleep. One in ten adults, and one in five of those over 65 years of age, have insomnia. Being unable to sleep is one of the most common complaints heard by doctors, yet our healthcare systems are barely scratching the surface in offering a service that will help people.

Research conducted over the past 25 years has established cognitive behavioral therapy (CBT) as an effective treatment for persistent insomnia. Indeed, leading authorities now regard CBT as the treatment of first choice. But there is a problem – CBT is not widely available because clinical psychology services and behavioral medicine services do not have the capacity at this time to meet the potential demand.
These are professions that are, in relative terms, still in their infancy. So, while the research has been conducted and the evidence is there, the means to deliver CBT is lagging behind.

As one of the people who has been most closely involved with the development and evaluation of insomnia treatment, I want to help you make the best possible use of the CBT program that we have developed in Scotland. I believe that one of the ways to help overcome the scale of the insomnia problem that is out there is to put the solution, the CBT itself, directly into your hands. We as professionals must, and will, continue to lobby politicians and healthcare providers to develop much-needed services. However, there is also a lot that you can do to improve your sleep yourself, if you are given the right tools for the job.

This book is designed for your use as a CBT treatment manual. I have set out the different parts of the book, and the chapters within each part, so that you can use it as a CBT self-help program. You are about to set out on a course of therapy. I will be your therapist, as it were from a distance, but you must take on the role not only of patient but also of co-therapist. You will be learning and implementing at the same time . . . you will be evaluating your own progress . . . you will get what you give! Like any course of treatment, I ask you to take this CBT program seriously. Give it some of your best-quality time and attention.

In our studies evaluating the effectiveness of CBT we have seen a great many patients who thought they would never be able to sleep well, go on to make huge improvements in the pattern and the quality of their sleep. CBT offers you this prospect. Join me in helping you benefit . . . let’s overcome insomnia together!
PART ONE

Understanding Insomnia
Introduction to Part One

The first part of the book is about developing an understanding of sleep and of insomnia. I hope you will find that this is a helpful step towards your goal of learning how to overcome insomnia and how to become a good sleeper. Try not to be tempted to jump ahead to Part Two, especially if you are the kind of person who likes to ‘get on with it’! Part One will give you important background information that will make it much easier to put your cognitive behavioral treatment into practice.
What is sleep?

You may be surprised by this, but I would like to begin by explaining what sleep is not. This is important, because sleep is very commonly misunderstood.

First, sleep is not simply the absence of wakefulness. Falling asleep is not like having a light switched off, just as wakefulness is not the same as a light switched on. The on/off idea would suggest that we live our lives either at one extreme or the other. This is not in fact correct, because there are variations within sleep, just as there are variations in wakefulness. You are not always ‘wide awake’... are you? Similarly, you are not always ‘fast asleep’.

Second, sleep is not an inactive process. Sleep is not ‘down tools’ time, or a kind of respite or escape. On the contrary, the body’s activities during sleep are absolutely vital to life. Your sleep is a part of your life, not something separate from it – you have heard it said that we spend one-third of our lives asleep (I hear you say ‘I wish!’). Just because we are unconscious, and have no memory for the greater part of our sleep, does not mean that sleep is either a simple or a passive state.

So what then is sleep? The famous Israeli scientist Dr Peretz Lavie once wrote a semi-autobiographical book about his experiences in sleep research. He called the book The
Enchanted World of Sleep. For me this title captures the fact that sleep is rich, diverse, and precious; and still fascinatingly mysterious. We live our lives not just in the waking world. Let’s go and take a glimpse at life within sleep.

Research studies have shown us that sleep is a very complex, yet very ordered process. Scientists have discovered the exit of sleep by studying the activity of the brain during sleep-laboratory recordings. Sleep is made up of different subtypes and stages. Sleep is also orderly, because these types and stages of sleep are organized in a series of cycles that repeat across the night.

Sleep is also active in other ways. For example, it is during sleep that our body tissue is repaired. Proteins, the building-blocks of life, are laid down during sleep, and some hormones are produced selectively during the night, such as the growth hormone in developing infants and children. So there is some truth in the idea that we grow during the night! These are just a few examples of physical processes that occur during sleep, but there are also very important mental processes. We catch a glimpse of this in the phenomenon of dreaming. Of course, we do not always remember our dreams, but when we do what is very apparent is that we have been thinking, even while we were asleep. Enchanting!

Measuring sleep in the laboratory

In order to understand this complex process it may be helpful to find out a little about how sleep is ‘measured’ and analyzed; this is usually done in a sleep laboratory.

Scientists study sleep by taking three types of measurement:

1 Electrical activity in the brain is measured by electroencephalography (EEG). This measure is used because the
EEG signals associated with being awake are different from those found during sleep. Also, the different stages of sleep can be measured using EEG.

2 Muscle activity is measured using electromyography (EMG), because muscle tone also differs between wakefulness and sleep. Once again, there are EMG differences within sleep, depending upon the stage of sleep.

3 Third, eye movements during sleep are measured using electro-oculography (EOG). This is a very specific measurement that helps to identify dreaming sleep. The eyeballs make characteristic movements that show us when someone is in this type of sleep.
Figure 1.1 shows a typical sleep assessment taking place. Electrodes are placed at various points on the scalp and skin to pick up electrical activity. It may sound a bit uncomfortable, but it does not stop most participants from sleeping and it helps experts learn a great deal about sleep. So what happens when we look at normal sleep in a laboratory using EEG, EMG, and EOG?

This whole system of assessment is usually called polysomnography (PSG). The prefix ‘poly’ simply refers to the fact that more than one type of physiological activity is being measured. You can see some EEG readings of typical adult sleep in Figure 1.2. These illustrate the similarities and differences between the different stages of sleep. You can also make some comparisons of sleep with waking.

The stages of sleep

Let’s start with waking. Sometimes we call this Stage W (wakefulness). You will see that the EEG part of the tracing is characterized by what we call ‘fast activity’. EEG waves are fairly random and of low voltage. You will see in Figure 1.2 that they are of relatively low height (amplitude) and are generated in close proximity to one another (high frequency). Waking EEG of this type is known as beta activity. Notice the difference between this EEG and the one depicted in the third row in Figure 1.2. This is an EEG of someone in bed with their eyes closed, and you can see that the EEG waves no longer come quite as thick or fast. This is what is called alpha activity or alpha rhythm.

As we fall asleep we go into a transitional phase between wakefulness and sleep known as Stage 1 sleep. Compared with quiet wakefulness, the EEG waves in Stage 1 slow down to around three to seven cycles per second (cps). These are known as theta waves.
Figure 1.2 A polysomnographic (PSG) recording showing the different stages of sleep.
Figure 1.2 shows only the EEG for Stage 1 sleep, but if you were to see a measurement for muscle tone (EMG) during Stage 1, you would notice that the muscles begin to relax in comparison with wakefulness. Similarly, the EOG traces would change and begin to show slow rolling eye movements. Stage 1 sleep normally lasts only a matter of minutes before progressing to Stage 2.

You can see that the EEG varies considerably during Stage 2 sleep. There are mixed frequencies of EEG waves (some fast, some slow, some high amplitude, some low). However, there are two characteristic formations that occur repeatedly, and these are the defining features of Stage 2 sleep. The K-complex takes its name from the shape of an initially descending and then ascending sharp change in voltage. By tradition lines on the upward inclination in EEGs are called ‘descending’ and those heading downward are called ‘ascending’ – this may seem odd, but it is the standard terminology. The other features of Stage 2 sleep are known as sleep spindles – the name for rapid bursts of high-frequency EEG activity (12–14 cps) that occur intermittently. Although Stage 2 sleep comprises the largest proportion of adult sleep (50–60 per cent), the first phase of Stage 2 sleep is usually quite short.

We have the deepest part of our sleep during the first third of the night, and there is a more rapid transition into deep sleep during this period. EEG Stage 3 and Stage 4 together make up this deep sleep, sometimes called slow-wave sleep because the EEG now reveals higher waves occurring at much lower frequencies. The height of these delta waves will be 75 microvolts (μV) or greater, and the wave frequency has now dropped to its lowest at ½–2 cps. The difference between Stages 3 and 4 is simply the proportion of each 30-second period of sleep analysis during which delta waves are present. For Stage 3 sleep, 20–50 per cent comprises delta waves, whereas more than 50 per cent is required for
describing sleep as Stage 4. Deep sleep is a form of \textit{synchro-}
\textit{nized sleep} because the brain’s electrical activity settles to a
harmonized rhythm, and so produces the steady ‘beats’ that
you can see in Figure 1.2.

So far, then, we can see that the transition from wakefulness through to deep sleep involves not only a loss of
consciousness, but also a steady change in the EEG wave
pattern from fast to slow activity, and that four stages of sleep
can be differentiated. However, in 1953 two researchers in
Chicago, Dr Kleitman and his young assistant Dr Aserinsky,
made a crucial discovery about sleep. They noticed that there
was another form of sleep during which the eyeballs move
rapidly, whereas the rest of the body is pretty much para-
lyzed. The term \textit{rapid eye movement (REM) sleep} was coined,
and so important was its discovery that all the other Stages (1,
2, 3, and 4) actually became known as non-REM sleep.

You can see in Figure 1.2 that the EEG during REM sleep
does not look very different from wakefulness or from Stage
1 sleep. Indeed, it is a form of light sleep. However, the EOG
shows very characteristic eye movements, and the EMG
shows a marked flattening (loss of muscle tone). This actually
makes sense when you think that it is during REM sleep that
we do most of our dreaming. Were it not for the fact that our
major voluntary muscles are relaxed, we could easily injure
ourselves by acting out our dreams! You may not have
realized before that you are in fact very still in your bed
during your dreams, in spite of whatever vivid dream
imagery you may experience. Occasional muscle twitches are
quite usual, but any movement on a large scale during REM
sleep is uncommon. In fact, if this does occur it may mean
that the person has a problem known as \textit{REM sleep behavior
disorder}. This is not the same as \textit{sleepwalking}, which occurs
during periods of non-REM deep sleep. I will explain more
about the different disorders of sleep later in this book.
Evaluating a sleep recording

Sleep records from the sleep laboratory are scored by highly trained professionals into the different stages of sleep. Sometimes we call this process staging sleep. We still use a standard set of scoring rules developed in the USA in the late 1960s by Dr Rechtschaffen and Dr Kales. In the early days, information from each recording channel (EEG, EMG, EOG) was printed out and reviewed page by page. Nowadays this information is analyzed on a PC screen and the person doing the scoring scrolls through, allocating each 30-second chunk, or epoch, to one of the sleep stages.

After a sleep recording has been scored, the computer generates a sleep report. This summarizes the night and provides useful information for the researcher to work with. An example of an abbreviated sleep report from my own lab can be seen in Figure 1.3. Let me take you through the information presented there.

You can see that the report begins with record identification information about the patient. Obviously we do not want to give away any confidential details, so we have called this 50-year-old man John Smith, and given him a made-up date of birth. He has a diagnosis of ‘psychophysiologic insomnia’ and has had persistent sleep problems for the past 12 years. You are going to hear a lot more about this type of insomnia later in this book. Each patient is given a unique sleep study code, and his or her hospital number or research protocol number would usually be included. Here you will see the file name is simply made up from this sample patient’s name, the lab bedroom he slept in (lab 2), and the night of his stay (night 3).

Next there is a section of the report headed sleep parameters. You can see that we use the standard 30-second epoch length for scoring sleep stages. John Smith’s bedtime was recorded
Figure 1.3  A sample sleep report
as 10:50 p.m. and his rising time as 7:21 a.m. This means that his time in bed (TIB) was just over 8 ½ hours, at 511 minutes. However, he did not sleep for 8 ½ hours! As you can see, John Smith has a severe insomnia problem.

We use the term **sleep-onset latency** (SOL) for the length of time it takes someone to fall asleep. Here the SOL is 122 minutes, so it took John Smith more than 2 hours to get to sleep on this particular night. As well as the time taken to get off to sleep, we are interested in whether or not there were problems staying asleep. This report contains two pieces of information about the continuity of John Smith’s sleep. You can see that nine **awakenings** from sleep were recorded. **Wake time after sleep-onset** (WASO) is the total amount of time spent awake during these awakenings. Here the WASO was 34 minutes, so we can work out that John Smith’s wakeful episodes were relatively brief. Nevertheless, these can be quite disruptive because they impair sleep quality. If you think about it, together SOL and WASO represent the most common insomnia complaints: difficulty getting to sleep, and difficulty staying asleep. John Smith’s **total wake time** (TWT) was 156 minutes.

Of course, we also want to know how much sleep John Smith obtained. You can see, therefore, that his **total sleep time** (TST) amounted to 5 hours and 53 minutes.

The sleep parameters section also includes information on something called **sleep efficiency** (SE). This is an important figure because it tells us the proportion (percentage) of the time in bed that was spent asleep. It is calculated as TST/TIB × 100. In this example, total sleep time (TST) was 353 minutes out of the 511 minutes of time in bed (TIB), so the SE was 69 per cent; a pretty poor night by any standards! Generally, we think of an SE below 85 per cent as being a potential problem, and above 85 per cent as being good sleep. This of course raises the interesting point that it is not
necessarily *how much sleep* we get that is important, but *how good a quality* it is. Sleeping through for 6 continuous hours from lights out to waking would give an SE of 100 per cent, whereas getting a total of 6 hours broken up over an 8-hour period would give an SE of only 75 per cent. You will find out later that improving your sleep efficiency is one of the key requirements in overcoming insomnia.

We now move on to the *hypnogram* and the sleep stage percentages. The hypnogram gives us a picture of John Smith’s sleep pattern across the night, throughout the different stages of sleep. You can see, for example, that his awakenings generally happened in the second half of the night. The sleep report gives us the percentage of the night spent in each stage of sleep (1, 2, 3, 4, REM). Over half the night was spent in Stage 2 sleep, with a further 24 per cent in Stage 1. As I explained earlier, Stage 1 sleep is a transitional form of sleep that normally makes up a relatively small percentage of our total time asleep.

John Smith’s total slow-wave or deep sleep can be calculated by adding together his sleep Stages 3 and 4. This amounts to only 47 minutes, or around 13 per cent of the night. So we can deduce that John Smith must be quite a light sleeper.

Looking back to the sleep parameters, you can also see that his *latency to REM onset* – that is, how long it was before the first episode of REM sleep occurred – was 213 minutes on this particular night. This is much longer than we normally find on a good night’s sleep, when 60–70 minutes would be more usual. John Smith spent a total of 36 minutes in REM, about half what we would expect to see in a man of his age. Finally, you can see that the report contains sleep stage information on Stage W, and another category, *movement time* (M), which we use if it is not possible to decide on a sleep or wake stage. This might be when the EEG channels are
impossible to read. In John Smith’s case this measurement wasn’t necessary, though there was a brief technical intervention (perhaps checking an electrode) by one of our staff.

Before leaving this topic I want to take a moment to consider whether or not people sleep normally in a sleep laboratory. You might be thinking that with all this equipment attached, your sleep continuity and sleep quality might be quite different . . . and of course there’s the added element of being in a strange environment. Dr Jack Edinger from the VA Medical Center, Durham and Duke University, North Carolina, has completed a number of important studies investigating home versus lab-based sleep-assessment (polysomnography, or PSG) in insomnia. His findings are interesting because they suggest that it might be better if sleep could be measured at home, because in a lab setting people can actually sleep better than usual. In part this could be due simply to the change of environment. Another possibility is that they might not expect to be able to sleep in a lab, and those lower expectations could mean that they are less anxious about sleep, and so sleep better. This research work, then, also introduces us to one of the psychological components of insomnia – the importance of expectations!

On the experience of sleep

You have probably never been to a sleep laboratory, but I am sure you have tried to measure your sleep somehow – perhaps by working out how long you think you have slept, or how long it took you to fall asleep, or how many times you woke up during the night. These are measures of the experience of sleep, of what you remember about your sleep, and of the conclusions that you draw about your sleep. I bet you have found that it is not easy to calculate these things very accurately.
You may even have tried to keep some type of Sleep Diary so that you can see what your sleep is like over a period of time, or to try to work out if there is a pattern. Diaries like this are very useful, and we will be using them quite a bit as we assess and treat your insomnia. What I am saying is that your experience of sleep is very important, because that is what you have been living with.

Sometimes it is easier to think about the quality of our sleep rather than its quantity. Sleep quality and sleep efficiency have something in common. For example, you might feel that you have had a ‘good sleep’ or a ‘deep sleep’ – or, perhaps more likely because you are reading this book, that you have had many nights of ‘restless sleep’ or ‘hardly any sleep’, or that it takes you a long time to get into a proper sleep. It’s not always easy to convert these kinds of experience into numbers. Whether we are trying to estimate quantity or commenting on sleep quality, this is called subjective assessment. But we should not fall into the trap of thinking that subjective assessment is less important than the objective kind (as is done in sleep clinics). What you think and feel about your sleep is extremely important, not least because it is your experience of sleep (or lack of sleep) that usually makes you seek help in the first place.

It is likely that it was your experience of poor sleep that led you to be interested in this book in the first place. So it will be important for you to keep accurate records of your subjective sleep experiences, and I will help you make best use of a Sleep Diary. This form of assessment is recognized internationally as essential for clinical work in insomnia. In other words, the experience of insomnia, systematically summarized on a night-to-night basis, is the most important thing in eventually treating it.

There are different sub-types of insomnia, and we will be learning more about these in Chapter 3. One of the more
common ones is psychophysiologic insomnia. In this form of insomnia, the person’s experience of sleep can be confirmed by objective measurements such as PSG. In other words, someone with psychophysiologic insomnia may estimate that on a given night it took 45 minutes to get to sleep, and assessment will confirm that they had difficulty getting off to sleep. Similarly, if the problem was staying asleep (a sleep maintenance problem), both objective tests and self-reports will tend to agree.

However, you may be already familiar with the common finding from research that people usually sleep longer than they think they have done. Research literature tells us that people with insomnia tend to overestimate how long it takes them to fall asleep (SOL), how long they are awake during the night (WASO), and their total amount of sleep (TST). This has been taken by some to mean that people with insomnia ‘exaggerate’ their problem. Little wonder that many people with insomnia feel that their complaints are not taken seriously. However, this discrepancy should not surprise us. People who are normally good sleepers are likely to make very similar ‘errors’ in estimation on those occasional nights when they sleep poorly. This suggests to me that it is not so much the person with insomnia who is in some way at fault, rather that the task is actually quite a hard one, and one that good sleepers seldom have to perform. During the night, in the absence of stimulation and activity, time can appear to pass rather slowly (don’t you know it!).

Another possibility has some support from recent research on insomnia carried out by Dr Michael Perlis at the University of Rochester in New York State. This work suggests that sleep assessment (PSG), when scored in the conventional way into sleep stages, may fail to identify more subtle EEG characteristics that form part of the underlying pattern in insomnia. For example, a tendency towards waking up very,
very briefly, or the presence of fast EEG waves (as in wakefulness or light sleep) intruding into sleep, may correspond better to subjective experiences of insomnia. In other words, we may in time need to study sleep using a different set of criteria. Much more research in this area is required.

But I never slept a wink!

‘Oh yes, you did,’ you will have heard; ‘Oh no, I didn’t’ you may have answered, or felt like answering! Hopefully, the sections above can help you understand how differences can arise in the way people perceive sleep. There is, however, a particular form of insomnia where the hallmark feature is this debate, or I might even say dispute, about whether or not sleep actually occurred.

Clinicians and researchers have come to recognize a disorder that used to be called, until very recently, sleep-state misperception. In this type of insomnia the individual remains convinced that he or she obtained no or hardly any sleep, often over many years. On the one hand this seems unlikely, but on the other hand there can be no doubt that these beliefs are sincerely held, by perfectly sensible and reasonable people.

When this disorder has been studied in the laboratory, sleep patterns that are fairly normal are often found. How can this be? Well, perhaps these are extreme cases of the disparity between different methods of assessment; the ‘subjective–objective discrepancy’. But we might just as accurately conclude that assessments such as PSG are simply not up to capturing the nature of this type of sleep experience. For these reasons, this disorder has now been given the name paradoxical insomnia, to reinforce the paradoxical nature of the problem: apparently sleeping well yet complaining of severe insomnia. Paradoxical insomnia should be a priority
for further research, and I feel strongly that this diagnosis should not be misused to criticize people who have such symptoms.

Let us never forget, then, that a person’s individual experience of sleep may be different from the sleep records obtained in a sleep lab. Both are important, and they are not necessarily in competition with one another for ‘right’ and ‘wrong’. We need to recognize that concern about insomnia is what brings people to the attention of health services. Without that, no help will be offered, or needed. I am sure that time, and good science, will tell that there are better laboratory measures yet to come.

**What controls our sleep pattern?**

Two processes are commonly recognized as working together to regulate our sleep pattern. One is called the *sleep homeostat*, and this controls our ‘drive’ for sleep; the other is called the *circadian timer*, and controls when we sleep.

Broadly speaking, the longer we are awake, the sleepier we will become. Extended wakefulness, therefore, increases the body’s drive for sleep. In physiology, this kind of process is there to restore balance, so sleep reduces the drive for sleep, and wakefulness increases the sleep drive, in much the same way that we become parched if we go without fluids, and drinking satisfies that thirst and so reduces the drive to drink.

The famous sleep researcher Dr William C. Dement from Stanford University, California, uses the helpful analogy of the ‘sleep economy’. With each hour that we spend awake we accumulate an increasing *sleep debt*. In healthy good sleepers this debt is repaid in full by the night’s sleep and they awaken refreshed and back ‘in balance’ the next morning. The analogy raises the possibility that there are individuals who, perhaps through lifestyle choices or for other
reasons, find themselves in a state of chronic sleep debt. Indeed, there may be attitudes within some parts of modern society that encourage such lifestyles and pay scant attention to nature’s way of replenishing and restoring the body. The drive for sleep is, naturally, stronger when we first go to bed than it is later on, and this accounts, for example, for why it is that a nap can make us feel much better. Similarly, some people report waking after a couple of hours of sleep and feeling quite awake and refreshed. It is also a reason, of course, to avoid napping if you have insomnia, because naps have the potential to reduce the body’s drive for sleep during the night, when you really want it to work for you.

You may have heard of the circadian rhythm. This is a term used to describe the harmony of the sleep–wake schedule. Other functions apart from sleep, such as body temperature, also follow recognized circadian patterns. We are designed to function in a 24-hour world. The word ‘circadian’ derives from the Latin words circa diem, literally meaning ‘around the day’. Sometimes we talk about the body clock, meaning pretty much the same thing.

Our circadian rhythm takes a little while to become established. During early development an infant’s sleep is not organized into day and night phases. Instead, babies sleep and wake across the 24 hours. By around 6 months, however, the major sleep period becomes concentrated and more settled during the night-time hours of darkness, there is more wakefulness during daytime/daylight hours, and the body clock gradually approximates to local time. The hormone melatonin is largely responsible for the ongoing regulation of the body clock throughout our lives. Melatonin is produced in the brain, in the pineal gland. Its production rate is dictated by natural light, so that during hours of darkness (the normal sleep period) melatonin production increases, and as morning approaches and with the coming of daylight, melatonin
production is once again shut down. Of course there is some natural variation in circadian alertness during the daytime. For example, you will probably be aware of the afternoon dip when we tend to feel temporarily rather more tired. Indeed, in some societies it is normal to have a siesta at this time because it also coincides with the hottest part of the day. In terms of our circadian tendencies there is much to be said for that lifestyle!

Before moving on from this section, however, it is important to note that it is the interaction of the sleep homeostat and the circadian timing mechanism that, under normal circumstances, leads to good sleep. This is when the drive for sleep becomes strongest during normal hours of darkness, and results in an absence of pressure for sleep during wakeful, daylight hours.

I believe there is another component that regulates sleep. I call this automaticity. People who sleep well usually have absolutely no idea how they do it. Perhaps you have asked them! My point is that the automatic nature of this type of ‘control’ over sleep is crucial to normal, good sleep. Contrast this with insomnia, where the would-be sleeper is often preoccupied by his or her sleep problem and its consequences. I call this the attention–intention–effort cycle. This is a process that inhibits the natural, automatic control of sleep, and it leads to insomnia. We will be learning a lot more about this and how to overcome it using CBT methods.

Why do we need to sleep?

Sleep is not an optional extra in life; it is a fundamental requirement. In fact, you could survive for three times as long without food as you could without sleep. Much of what we know about the importance of sleep comes from experiences of people who have taken part in sleep-deprivation
experiments. That is, where insufficient sleep, or no sleep, has been taken over successive 24-hour periods. The bottom line is that when people are sleep deprived they are not able to function properly during the day. So, one simple answer to the question ‘What is sleep for?’ would be that the purpose of sleep is to make sure of good-quality daytime functioning. Let’s break that down into three components – physical, mental, and emotional.

We touched earlier on the fact that sleep is required for tissue restoration and for recuperation. During sleep, tired muscles recover and new proteins are synthesized. We also found out that one of the reasons that infants and children need so much sleep is because they are growing . . . and because they are expending a lot of energy! Equally important, however, is the requirement of sleep for mental purposes. Indeed, among the most striking effects of loss of sleep are inattention, disorientation, and memory problems. This should not be surprising, because sleep loss causes fatigue, drowsiness, and ultimately an inability to remain awake during the day. If we are to be alert and mentally fit in our everyday lives, we need to sleep well. Finally, sleep is extremely important for our emotional functioning. Psychological well-being depends on sleep, too. When we have not had enough sleep it is likely that there will be emotional consequences! Irritability is a common one, and perhaps feeling overly anxious or excitable. It is as if the brain is trying to compensate for its own sluggishness by making us more aroused. Sometimes, though, people experience a more downbeat mood, like feeling rather ‘flat’, and even depressed, after a period of poor sleep.

It seems, then, that sleep has its physical, mental and emotional processing components, and where sleep quality is impaired, these processes are not able to do their work so effectively.