

# **Teenage Sleep: Understanding and helping the sleep of 12-20 year olds**

By Dorothy Bruck<sup>1</sup>

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## ***SOME STRANGE SLEEP FACTS***

- 80% of teenagers report having unusual behaviours during sleep
- Hyperactivity in some young people may be due to a sleep problem
- Scary monsters in nightmares can be controlled
- Identical twins can have the same dreams
- Most sleep problems occur in teenagers and the elderly
- Sleep walkers have been acquitted of murder
- Ten percent of teenagers have clinically significant anxiety causing sleep problems
- Wet dreams are not necessarily about sex
- You can dream of your own death and survive
- Over a third of primary school-aged children experience problematic night fears
- Lack of sleep can cause hallucinations
- Sleepiness affects driving ability very much like alcohol
- Collapsing with laughter may actually indicate a sleep problem
- After puberty boys have penile erections about every 90 minutes during sleep
- Snoring can affect school work
- Nine out of ten people who play a skiing computer game, dream of skiing that night

## ***ABOUT THIS E-BOOK***

This e-book is the only one published about the sleep of teenagers, written for parents, school counsellors, youth health workers, high school teachers and teenagers.

The time around puberty is when there is a lot of changes in sleeping behaviour, a time when some weird things to do with sleep or dreams either stop or start. A time when people start doing things when they are awake that change the way they fall asleep (or don't fall asleep) or change the things that happen during sleep. If we look across the lifespan from birth to old age we find that there are two age periods of high sleep disturbance. The first is in teenagers and the second is in elderly people. There are lots of books for parents about getting babies to sleep and sometimes they have a section on other sleeping issues that may happen to older children. These aren't very helpful for information about the sleep of teenagers because they don't address the special issues associated with this age group.

One of the issues for anyone with a problem with sleep is getting others to take it seriously. This is because we are all *familiar* with sleep- not only do we all do it –usually once within every 24 hour period, but we also all sometimes have had a problem with sleep. So it's easy for others – friends, parents, doctors- to mistakenly take an attitude that is too casual. It's seen as just a 'nuisance', something that will go away. One doctor brushed aside a patient's complaint of excessive sleepiness with "I wish I could sleep so easily". Yet the consequences of sleep problems for the Australian population have been calculated to be very major indeed. In economic terms it costs the country

***A unique e-book on the sleep of teenagers.***

***Teenagers and the elderly are most likely to report sleep problems.***

about 3 billion dollars every year.<sup>2</sup> Very little of this is for direct medical costs or sleep related accidents, most is for lost productivity due to the daytime consequences of sleep problems.

This guide brings together a lot of things about sleep. It includes behaviours that can happen during sleep and discusses problems like night fears, wet dreams, scary dreams, sleep deprivation, snoring, needing too much sleep, not being able to get to sleep or stay asleep. Sleep walking, feelings of restless legs, being paralysed, midnight binge eating, the meaning of dreams and many other things are all covered.

We need this e-book because strange things can happen during sleep and we need to try to understand them. Sleep is so important to our wellbeing that if something starts to go wrong and continues to go wrong, it can cause lots of personal and social problems, poor school marks and probably also physical illnesses. Parents start to get worried when these things start to happen. In some cases neither the young person nor the parents even realise that the root cause is a sleep problem. They may blame it on laziness, anxiety, depression, nutrition, drugs, parties, alcohol, caffeine, boyfriends/girlfriends and so on.

This e-book provides enough information to understand the key aspects of teenage sleep. This will allow you to judge how seriously to take a sleep

***Being healthy  
depends on  
having healthy  
sleep.***

problem and what you can expect. Information can be powerful. You can use it to decide if it is necessary to see a doctor or sleep clinic. Or perhaps the problem is best tackled by working on changing some behaviours. Occasionally some simple guidance, reassurance and a wait-and-see approach is best.

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<sup>2</sup> Access Economics 2005 report

Teenage sleep issues are presented through a series of questions and answers that are organised into seven chapters. In Chapter 1 we consider a range of background issues about sleep, including sleep need, different types of sleep, individual differences in sleep, body rhythms and the effects of little or no sleep. In Chapter 2 we look at how common sleep problems are in young people, the effects of different illnesses on sleep and sleep medicine. Chapter 3 discusses the most prevalent sleep problem, which is, *getting to sleep or staying asleep*, while Chapter 4 provides advice on how to help with problems of this type. Chapter 5 considers disorders related to *sleeping too much and daytime sleepiness*. Teenage body rhythm issues come up in all of the chapters as they can be quite central to many issues of sleep for young people. *Events and behaviours that happen at sleep onset or during sleep* are covered in Chapter 6, along with advice on how such events can best be handled. In the last chapter we look at dreams from many different points of view. We also consider whether the content of dreams may mean something important and discuss the possibility of taking control of your dreams. Some chapters and appendices include questionnaires to assess different aspects of sleep/wake behaviour.

**Questions  
across  
seven  
chapters.**

This guide could be read in a sequence from beginning to end. Points made earlier are built upon in latter questions. However, some people like their information like a smorgasbord of food; they can take what they want from different plates. It's fine to jump from one topic to another and to help those who like to do this, footnotes will refer you to other sections of the e-book where different things are discussed so key points of interest can be followed up. However, if you intend to take this approach its worth first reading about the fundamental distinction between the two types of sleep, REM and non-REM sleep and this is early in Chapter 1 (Questions

10 and 11). We talk about REM and non-REM sleep in many places throughout this e-book. After the seven chapters some useful web sites (with a brief comment) are included. Many web sites have useful self-help information. The resources are not restricted to be just about sleep but cover a wide range of issues that young people may experience while awake that can lead to problems with their sleep.

## ***CHAPTER 1: All about sleep***

### **1.1 How does the need for sleep change across the lifespan?**

Sleep need is a very individual thing and some people seem to need more sleep at all stages of their life than their friends of a similar age. Patterns of sleep may change a lot at puberty but the overall amount of sleep needed does not decrease at this time, in fact it increases. Research has looked at how much sleep children and teenagers need to maintain the best level of alertness during the day and found that nine and ten year olds need one to two hours of sleep *less* per night than young adolescents. At the time of puberty teenagers typically need nine to nine and a quarter hours of sleep per night. Yet many teenagers sleep considerably less than this every night and their daytime alertness is thus reduced.

If a group of adults have the possibility of sleeping as much as they like for several weeks, the average that they can manage is 8 hours and 40 minutes every night. It seems this is the maximum possible average. Two thirds of all adults (aged from 16 to 50 years of age) get between 6.5 and 8.5 hours sleep per night. Only 5% of the population are short sleepers (sleep less than 5.5 hours per 24 hour period) or long sleepers (more than 9.5 hours). Elderly people need less sleep (about 7 hours) and they may find it harder to get all their sleep in a single block at night. Many elderly people have daytime naps and this is likely to make their night time sleep worse.

***The average sleep need for teenagers is around nine hours every 24 hours.***

## 1.2 Does the timing of sleep change with puberty?

The teenage years are a time of some major shifts in the body clock, an internal structure which drives our daily rhythms. The body clock undergoes some important changes with puberty, specifically the timing of certain hormones change to cause the body to want to go to sleep later. So a ten year old may have been sleepy and ready for bed at 9pm every night but at, say, 15, doesn't feel at all sleepy at 9pm.

***With puberty, melatonin delays the ability to fall asleep.***

The hormone melatonin, which is sometimes called the 'essence of darkness', starts to be secreted as we start feeling ready for bed. Melatonin works with the body clock to help us fall asleep easily. From the onset of puberty this hormone kicks in at a later clock time than in childhood. Thus, young people who are past puberty tend to stay up longer in the evenings than they did when they were younger. Interestingly, this effect has also been documented in adolescent monkeys. As with most biological things, some people are more affected by the hormone delaying their evening wave of sleepiness than others. If we consider puberty as marking the onset of adolescence, with its associated delay in evening sleepiness, then one question that arises is when is the end of adolescence? In other words when does the delay in sleepiness start to wear off and the teenager feel like going to bed a bit earlier, more like the time of their parents? Recent research suggests that there is an abrupt change in the timing of sleep at around the age of 20 years, suggesting that this may be a biological marker of the end of adolescence.

***Going to sleep depends both on the body clock and the build up of sleep pressure.***



There are two factors which determine how readily we fall asleep in the evening. One is the timing of the body clock, which in teenagers past puberty acts to delay the desire for sleep. Thus for most teenagers going to bed in the mid hours of the evening means they will be unable to go to sleep for a while. The second factor is how sleep deprived the person is. Thus, if they had done without their usual sleep for several days, the pressure for sleep may override the body rhythms wish to delay sleep. Younger teenagers are more sensitive to this night time sleep pressure than older teenagers. This means both the body clock and reduced sleep pressure make it easier for older teenagers to delay bedtime. Getting up at midday or a daytime nap will reduce the night time sleep pressure.

***Lifestyle changes often mean teenagers go to sleep later.***

Because the melatonin hormone kicks in later after puberty, the whole sleep/wake pattern gets shifted (or delayed). That's no problem if the time of getting up in the morning can be chosen. Unfortunately, few of us have that luxury on most days of the week. School or work starts at a set time even if the body clock feels like its two hours too early.

***Changing sleep-wake patterns means your body becomes confused about when it expects to sleep.***

Teenagers' sleep times are also affected by activities like going out with friends more, watching late night movies, forgetting the time playing computer games, after school sport activities and homework commitments. Parents have less say over bedtimes as young people move through their teens. Also their relationships are changing and this may lead to increased stress that will prevent them going to sleep when they want to.<sup>3</sup> Sometimes they are awake long after their body clock has

<sup>3</sup> see Q4.3 for information on emotional problems and sleep and Q3.14 for stress effects

told them they should be asleep. This adds to their sleep loss and can also mean that there are big differences in the clock times when they are asleep in any one week period. The body clock is disrupted and it may feel like it's on shiftwork with a constantly changing shift roster. We know that the sleep of shift workers is less restful because they try to sleep at times when their body clock is not expecting it. This can lead to feelings of moodiness, irritability, depression and poor concentration.

***The Monday morning alarm comes as a real shock.***

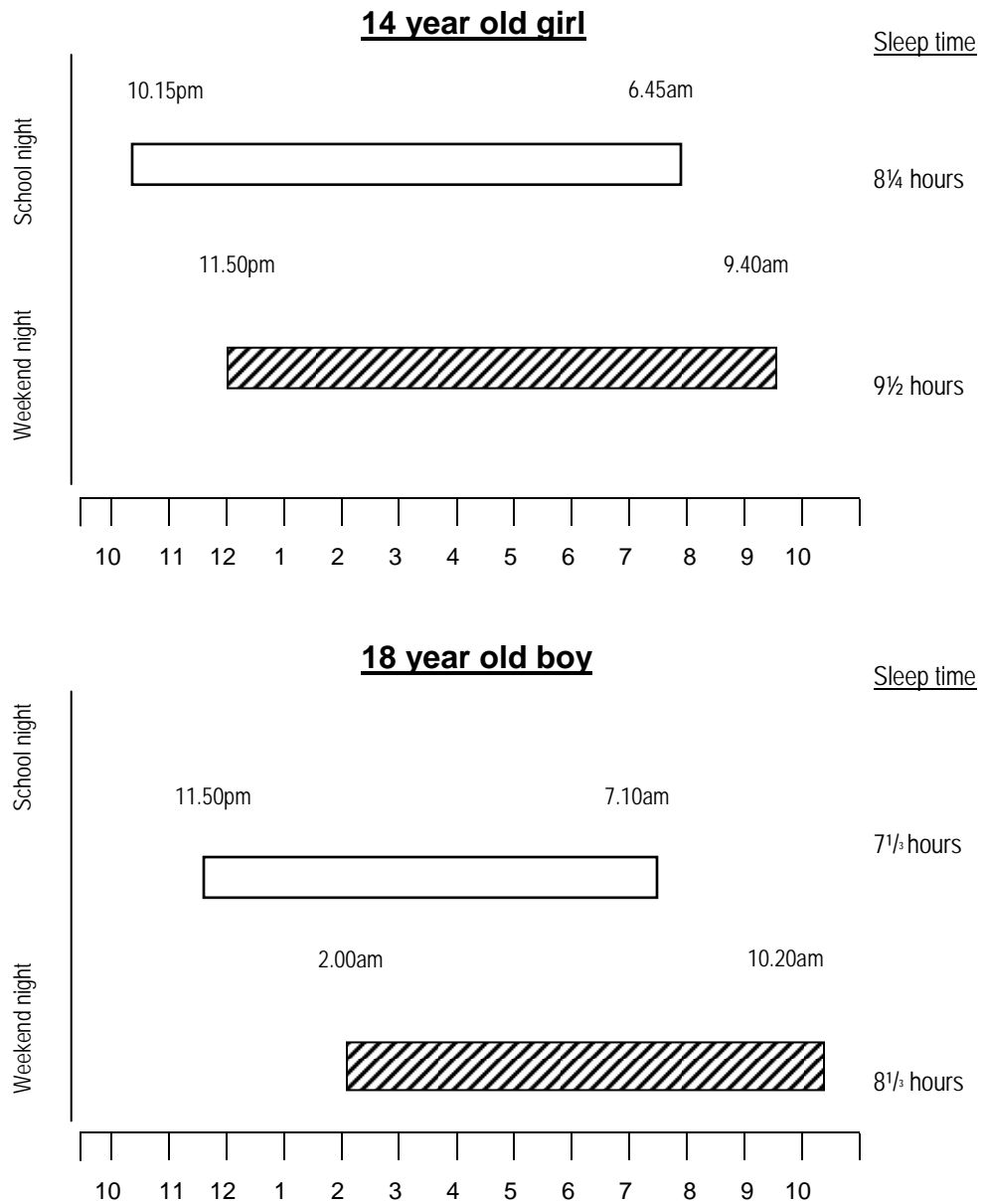
### **1.3 Why do teenagers often sleep in on weekends?**

Almost every parent of a teenager complains about how they like to sleep in of a morning, especially on weekends. During a normal week teenagers become more and more sleep deprived from Monday to Friday. With no particular need to get up on a weekend, sleeping in till all hours of the morning or afternoon seems the natural thing to do. Research has confirmed that as adolescents get older they go to bed later, sleep less and have very different sleep times on weekdays compared to weekends. The time of getting up on weekends can shift by one and a half hours in 12-14 year olds as puberty kicks in. Differences between boys and girls are only slight (girls tend to go to bed and get up a bit earlier). Figure 1.1 shows typical sleep times on school nights compared to weekend for teenagers of different ages.

***Weekends are a good time to recover lost sleep.***

A very common experience for teenagers is the Monday morning blues. They shift their body clock over the weekend to be more and more delayed and then an early getting up time becomes very difficult. Young people can be groggy for hours on a Monday morning because their body wants to catch up on its need for deep sleep. It's like the spring daylight

saving time shift but it involves a body clock change of more hours and it happens every week. Ongoing body clock problems can cause major sleep problems that look like insomnia.<sup>4</sup>



**Figure 1.1:** Typical sleep patterns on weekdays and weekends in teenagers.<sup>5</sup>

<sup>4</sup> See Q3.1 for more information on this, including a disorder called delayed sleep phase syndrome

<sup>5</sup> Data from a sample of 6,632 Italian high school children (Giannotti & Cortesi, 2002).

In some countries school starts very early (between 7 and 8 am) and starts earlier for older students than younger ones. Biologically this is the opposite of what should be happening. Later school times would be easier physiologically for the older students. As the pioneer of adolescent sleep research<sup>6</sup> put it, 'The students may be in school, but their brains are at home on their pillows.'

***Most teenagers are more alert in the evenings.***

#### **1.4 What is a 'morning' or 'evening' type person?**

Morning type people like to get up early in the morning and get going. Others like to stay up late in the night and we call these evening types. There are people of each type at all ages and some people stay the one type all their life. There is a general trend, however, for people to be more of one type than the other at certain stages of their life. Teenagers are, in general, more likely to be evening types due to the delay in the evening secretion of melatonin discussed in the last question. Of course, some teenagers will be morning types, but these are in the minority. From middle age onwards there is a general tendency for people to become more of a morning type. Researchers have shown that the different types have different peaks and troughs of some bodily events such as body temperature and particular hormone secretions that follow a daily pattern. You can see whether you are a morning type, evening type, or somewhere in between by doing the questionnaire in Appendix A.

***Older teenagers would benefit much more from later school starts than younger teenagers.***

---

<sup>6</sup> Professor Mary Carskadon

## 1.5 Can some people survive on little or no sleep?

It is true that some people are very short sleepers. The shortest sleepers that have been monitored in a sleep clinic did well on between one and three hours of sleep every 24 hours. No claims of living without sleep have ever been verified. When we look at the sleep patterns of short sleepers we see that they are very efficient at getting the two types of sleep that we know are very important – the deepest stage of sleep (stage 4) and REM sleep. Very short sleepers sleep very efficiently. We know that these form ‘core sleep’ because they are the ones that the body catches up on first if it has gone without sleep. Some sleep researchers argue that we can train ourselves to survive on about six hours of sleep per night because we just need the core sleep. However, when people who usually sleep eight hours a night limit their sleep to just six hours every night for three weeks they start to have attention lapses that affect their ability to concentrate and drive. There are big individual differences in how well we can do on different amounts of sleep.

## 1.6 What happens if you don’t sleep at all?

This is a question that has been widely researched for a few different reasons. The first reason is that we often try to understand what something does by seeing what happens if we remove it. Thus some research on the question of why we sleep has taken the approach of stopping it. This is actually harder to do than it sounds because we have such a strong need for sleep. This need was identified in the middle of the twentieth century and, unfortunately, exploited by brutal regimes around the world. Ongoing sleep deprivation is the most common component of systematic torture.

***It is very hard not to sleep for a long period of time.***

In the 1960s the effects of going without sleep for many days was carefully monitored and these are described in Box 1.3.

The body has an amazing ability to make up sleep loss of many, many hours with a comparatively short recovery sleep. We can usually reverse the effects of major sleep loss in a couple of nights, but there is some evidence that young people may take longer to recover than adults.

### Box 1.3 Going without sleep for 11 days

The first volunteer in which the effects of sleep deprivation were monitored was Randy Gardner. In 1964, aged 17, he succeeded in staying awake for more than 260 hours. This is a continuous time awake of almost 11 days. The effects of no sleep changed across as the sleep deprivation went on. In order of appearance they included;

- trouble focussing the eyes
- moody, irritable and uncooperative behaviour
- seeing images and hallucinations
- speech difficulties
- short memory lapses;
- incoherent speech and thoughts;
- blurred vision
- major memory problems.

When he could stay awake no longer he recovered his lost sleep by extending the hours of his night time sleep for only four nights.

The second reason why this question of the effects of no sleep has been examined a lot is because the issue is of great interest to the military. The U.S. military has funded a lot of research on sleep deprivation. They want to know how long they can expect good quality performance from their soldiers in the field under continuous battle conditions where it may

***Hours of sleep loss is unrelated to hours needed for sleep recovery***

be hard for people to get much sleep. The question becomes: How long can someone perform adequately before their need for sleep has a major effect? The answer lies in what we are expecting the sleep deprived person to do. The next few questions will look at different aspects of this.

### **1.7 How does lack of sleep affect the ability to concentrate, think and learn?**

This is the area where we see the most major effects of lack of sleep.

Total lack of sleep for a while means the ability to think clearly will be less, especially on any work that requires some complex thought like arithmetic problems. How long a person can do without sleep before it has major effects depends on their personality and how motivated they are to tackle a task, but in general we see important changes after about 30 hours without sleep. That is, there is a major decline in the ability to think during the second night without sleep. The ability to maintain concentration goes down when trying to manage without sleep.

***Complex problem solving is difficult if sleep deprived.***

For most people sleep deprivation is not usually continuous, they are more likely to have a series of nights of less sleep than they need. This has very similar effects to total sleep deprivation but takes a little longer to develop, with the sleep loss adding up over time. Memory is reduced, as is the ability to do tasks that need visual and spatial abilities (such as working with different patterns or maps) or work involving coordinating eyes and hands, such as drawing and writing. Logical tasks do not seem to be as affected by sleep deprivation as creative ones. In children sleep loss has been shown to reduce verbal creativity and the ability to think abstractly. A higher likelihood of physical injury (eg in sport) has been associated with inadequate sleep in teenagers. With insufficient sleep

more time is needed to analyse situations and respond physically to events as they happen.

Teenagers build up a need for sleep, usually from bedtimes that are too late, and this affects their school work. We know that those students who are not getting enough sleep are also the ones who report the most dissatisfaction with school. One study reported that getting students to have earlier bedtimes resulted in improved performance at school. Another showed a direct relationship between sleep times and grades (see Box 1.4). Where students were sleepy during the day due to a sleep disorder, their performance at school was reduced until the problem was treated.

***The school performance of most young people is reduced by their ongoing sleep loss.***

**Box 1.4** Sleep and school grades

Researchers at Holy Cross (Massachusetts, USA) recently studied a large group of high school students to compare their average amount of sleep per night with their school grades. They found a direct relationship as set out in the table. However, we need to be careful before we assume that less sleep causes lower grades. It may be that both are related to a third factor such as the amount of supervision at home (eg of both bedtimes and homework).

Average time asleep per night	Grades earned
7 hours 21 minutes	A's and B's
7 hours 4 minutes	C's
6 hours 48 minutes	D's and F's



## 1.8 What are the consequences of being sleepy for driving?

Many studies have looked at the consequences for driving, where drivers need to keep their attention during the fairly monotonous task of watching the road. They measure how well they do by counting their 'lapses' on a simulated (pretend) driving task. Lapses are the number of times they strayed off the road or didn't respond to something significant that was happening. We believe that these lapses may be a result of 'microsleeps' or going into a robot-like state called 'automatic behaviour'.<sup>7</sup> One important study<sup>8</sup> found that 17 hours without sleep, (so that they missed one night of sleep and were driving at midday the following day), lead to the same number of performance lapses as drinking alcohol with a blood alcohol content of 0.05 percent (the legal limit in many places). If a driver went for 24 hours without sleep their driving performance was similar to if they had a blood alcohol content of 0.10 (way above the legal limit of most places). Yet people of all ages don't see driving when sleepy as a very high risk activity. The statistics tell a different story.

***Sleepiness impairs driving just like alcohol.***

At least 10% of all serious accidents and 20% of freeway accidents are due to driving while sleepy. The graph (Figure 1.2) shows how the rate of fatigue related accidents increases at night when our body expects us to be asleep – even though there are fewer cars on the road then. Notice how the rate also increases during the afternoon when we are all sleepier.<sup>9</sup>

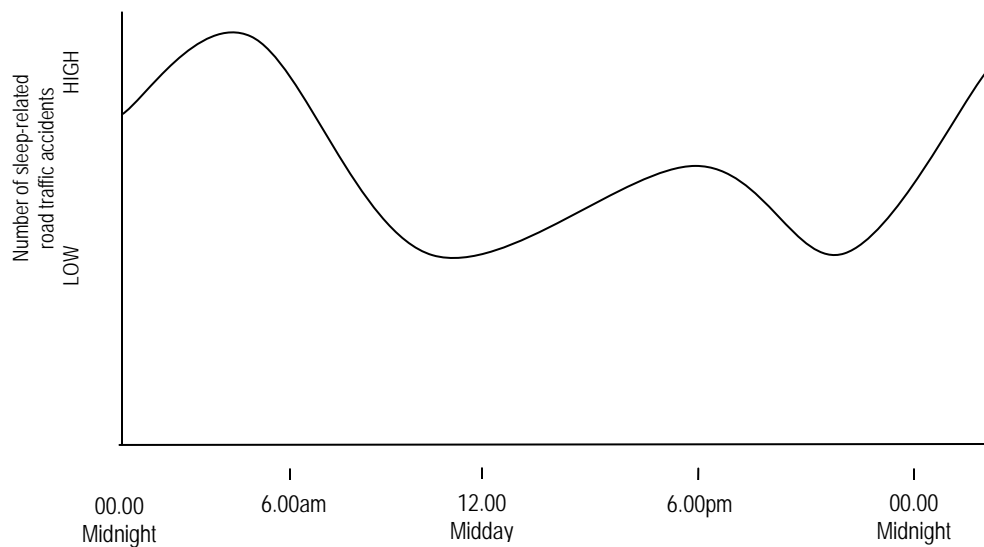
***Young drivers underestimate how quickly they can become dangerously sleepy.***

<sup>7</sup> See Q5.6 about microsleeps and Q5.7 about automatic behaviour

<sup>8</sup> Dawson & Reid (1997).

<sup>9</sup> See Q1.20 for details on the post lunch dip and afternoon sleepiness

Unfortunately it seems that young people are much more likely to have a car accident due to sleepiness than other age groups. Studies in the USA have shown that half of all sleep related crashes involved a driver aged less than 25 years. The peak age for a car accident due to sleepiness is 20 years of age. We think that this is because young drivers are not very good at all at making an accurate judgement about the risk of continuing to drive.



**Figure 1.2:** The number of car accidents due to sleepiness at different times of the day.<sup>10</sup>

Drivers may be okay at knowing when they feel a little bit sleepy but they do underestimate how this sleepiness can suddenly increase. Thus they feel safe to drive when sleepiness is at a low level but many aren't aware how quickly they can become unsafe drivers. The best thing is to avoid driving any long distances at times when the body is normally asleep. If

<sup>10</sup> From Shneerson (2000) p. 112.

driving at that time is unavoidable, having a 15 minute power nap before setting off and then have drinks containing caffeine will help. Passengers can be asked to stay awake and talk to the driver and watch for signs of sleepiness. One of the first sign of sleepiness is a change in speed due to the leg on the accelerator losing some of its muscular control. As well as losing some minor muscular control, the ability to react to anything becomes reduced and side vision is less active. The blinking of eyes may become erratic – at times they will blink more often and at other times they will stare more vacantly and the eyelids may droop. Attention can easily lapse and the car may wander. Yawning is a sign we all know about. The sleepy driver may be drawn to lights, especially the lights of a car in front and the likelihood of a rear smash is increased. People think that opening the car windows for a blast of fresh air may help or turning the music up loud. However, the stimulating effect of these activities is only mild and short lived. The best thing to be done (apart from a power nap) is have something to eat or drink, preferably with stopping the car and getting out. A caffeinated drink will reduce sleepiness for a while in most people. Many fatigue related accidents have only one young adult (most likely male) in the car and research has shown that this is the group who are most likely to say they are fine to drive when they are already having microsleeps.<sup>11</sup>

***Being  
sleepy  
increases  
the effect  
of any  
alcohol.***

If a person is already a bit sleepy or sleep deprived then having *any* sedative (including alcohol or antidepressants) will have a much greater effect. Under these circumstances the chance of a sleep related accident is three times higher than if they were not sleep deprived.

Having one drink of alcohol at a time when the body clock is taking a sleepiness dip (early afternoon from 2-4pm and early morning from 2-

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<sup>11</sup> See Q5.6 for more on microsleeps

6am) may have the same effect on the ability to drive as having two or three drinks at 10am.

### **1.9 How does lack of sleep affect physical health?**

The key question here is whether an ongoing lack of sleep can affect the immune system that helps fight infection. The answer is 'probably'. We know that when a person is sick, the immune system is helped by getting a good amount of sleep.

***The immune system wants and needs sleep.***

A lack of sleep may affect our health in another, unexpected way. The latest research suggests a link between not getting enough sleep and becoming overweight. It seems that if someone is not getting enough sleep the body uses glucose at a slower rate and this is likely to cause weight gain. Also being sleep deprived makes you feel hungrier. So, one secret to losing weight seems to be getting enough sleep.

***Sufficient sleep helps with dieting.***

### **1.10 How does lack of sleep affect emotional wellbeing?**

For many people emotional health is the first thing that is affected by poor sleep. We know from adult studies that ongoing poor sleep leads to mood swings, feeling depressed and being easily irritated. Studies with humans and animals show that sleep loss is associated with becoming aggressive more quickly than usual. Even one night without sleep can have this effect in some people. There is no reason to think that sleep loss affects teenagers any differently. In some people doing without enough sleep can lead to them being disorientated, hallucinating and even feeling that they are being persecuted. Such behaviour can be mistaken for psychiatric problems but they disappear

***Sleep helps us regulate our emotions.***

when the person becomes fully rested again. However, if the sleep loss or changes in behaviour is due to a sleep disorder that is not diagnosed, such ongoing odd behaviours may result in a referral to a mental health specialist.

***Sleep deprivation can lead to temporary, bizarre, psychotic-like behaviour.***

### 1.11 Do we only dream during part of our sleep?

To answer this question we need to go back fifty years when something was discovered that would revolutionise our understanding of sleep. In a laboratory in Chicago, a young doctoral student decided to do his research by recording people while they slept. He discovered something that had never been described before. At approximately 90 minute intervals during a night's sleep a person's eyes would suddenly begin to move under their eyelids and this would last anywhere from 5 minutes to over 20 minutes. This became known as Rapid Eye Movement (REM) sleep and from that time on sleep was described as consisting of two types of sleep - REM sleep and non-REM sleep. What was particularly interesting was that if you woke someone during REM sleep they were much more likely to report vivid, colourful, active, emotional, structured dreams than if woken up during non-REM sleep, when thoughts were reported as more everyday, commonplace, unemotional and possibly verbal problem solving. This discovery led to a lot of research which concluded that REM sleep is a third state, as different from other sleep types as it is from wake. Thus REM sleep has become associated with dream sleep - even though we now know that we have dream like thoughts all through the night, even in non-REM sleep. However,

***Two types of sleep were discovered.***

***REM sleep is associated with vivid dreaming.***

the dream-like thoughts that have a story and are most vivid seem to occur more in REM sleep. See Box 1.5 for examples of dream reports from each.

**Box 1.5** Examples of dream reports from REM sleep compared to NREM sleep

**Dream report from REM sleep:**

I am on holiday with my family – wife, children, grand-children, parents and [French] in-laws. We are in an English resort that has a long pier. The tide goes miles out. We all leave together to go to the beach, walking along the pier which gets wider and wider and becomes a town. My wife and grand-daughter are with a lady we don't really know who has been beaten by her husband in the past. Somewhere along the way they are slightly ahead of me and I am separated from them. I hurry along trying to see them, but I can't. I can't find them and I can't think where they've gone. I'm walking past shops that are packed with stuff, things hanging up outside – bags, rucksacks and so on; one of them looks as if it might sell cycling stuff but it turns out to be motorcycle stuff. My search for the others becomes increasingly frantic; I'm getting more and more anxious. I come out past the shops to the end of the pier and see the tide is coming in. I think they must be on one of the beaches. I'm traipsing round and round looking but I can't find them. The beaches are all around and very strange, with the tide coming in differently. On some it's just kind of trickling in, on others there are massive waves. One beach seems to be a partly nudist beach, which interests me, but there are also lots of weighty women wearing dark things. As the tide comes in people are launching themselves into the waves but when the water recedes I see that all the people are lying in piles of rubbish and I think it can't have been water at all. There is a ridge-like sandbank; it's the only thing the tide hasn't covered. As the water finally makes it over the top and down the other side everybody starts cheering. I finally find the others but the day is shot, the weather is darkening and we start to head back. It's getting darker and darker, I'm with my grand-daughter (4years-old), she's walking a bit in front of me along the mud-flats of an estuary. I'm trying to make this awful journey fun. There is a crack of thunder and a flash of lightening very close by and she's frightened. I try to explain how pretty the white light was, and it was, coming through the

mist, then we see a plane that's been struck by the lightning drifting slowly down out of the sky. It lands almost gently in the water and disappears beneath the surface. We are all staying somewhere awful, almost a ruin, with rubbish and litter on the floors, beds without mattresses. I think there's no way it would be safe to leave our stuff here. I can see that my in-laws are disgusted with it. My parents are there. Among the rubbish I find some blue psychiatric reports on people who were in a group therapy session. I see that one of the reports is on the daughter of some friends of my parents, and there seems to be a brief account of what caused her problem – her husband deserted her – and why she is there. I look quickly at some of the other reports just to see their ages, professions and so on. One is on a woman in her late twenties and the report notes that she 'wanted to be a priest'; another is on a man aged sixty-two. I'm thinking: how has my father got these notes and why have I found them? I come across some transparent plastic bags of my old clothes that my parents have been keeping. I start going through one bag and I can see that most of it is for chucking, but there are one or two things I think, how did that get in here? and I'm tempted to hang on to it, but I think, no, chuck the lot.



#### **Example of thoughts during a NREM “dream”:**

I am shopping at the local street shopping centre and I come out of the bakery and notice that the sky is dark and it might rain soon. I start debating whether it would be best to go home by train or by bus. In my mind I go through where and how far I need to walk from the bus stop or train station to home. I try to concentrate and calculate which route would mean I would get wetter if it rained. I am also thinking about which would get me home sooner and whether one route might get me home before it even rains. The different possibilities and problems of each route go round and round in my head without a decision being made before I wake up.



## **1.12 What happens in REM sleep compared to non-REM sleep?**

Since the discovery in 1953 that sleep consists of both REM and non-REM sleep the investigation of dreams has become intertwined with the

investigation of REM sleep.<sup>12</sup> Box 1.6 summarises some key differences between REM sleep and non-REM sleep. Notice especially how active some body functions are in REM sleep but also how some muscles are paralysed (unable to move), so we don't act out our dreams.

***Our muscles are paralysed while we dream.***

**Box 1.6** REM sleep versus non-REM sleep

	<u>Non-REM sleep</u>	<u>REM sleep</u>
Eye movements	absent	spiky, active, about 40 per minute
Heart rate	decreases	increases
Breathing rate	decreases	increases, becomes irregular
Brain waves	bigger and slower	active- similar to wake
Muscles	relaxed	paralysed
If awoken	report thoughts <sup>13</sup>	report a dream
Mental activity	flat, unemotional	vivid images, illogical, may be emotional
Sexual organs	relaxed	increased blood flow in penis (erection) and clitoris
Body movements	yes	no
Partial arousals (sleep walking, sleep talking)	yes	no

Once REM sleep, and its cycles every 90 minutes, had been discovered researchers put it together with events that had been observed and documented many years beforehand. This was the regular cycle of erections of the penis during the night in males, with each erection lasting up to 25 minutes at a time. The cycle of erections corresponds to the cycle of REM sleep and is one indicator of the many changes that happen during REM sleep.<sup>14</sup> These include increases in heart rate, breathing rate, blood pressure and blood flow to the brain.

***Erections of the penis happen regularly during REM sleep.***

<sup>12</sup> Chapter 7 is all about dreams.



### 1.13 Has our understanding of sleep changed over the centuries?

Until about 40 years ago sleep was seen as a very passive, inactive state. Going to sleep was like the setting of the sun, one 'dropped off' or 'fell' asleep. It was like a small death from which one was revived the next morning. It was assumed that the brain and the body basically shut down. We now know that sleep is a very active state, and the amount of oxygen we use in some brain parts is higher when asleep than while we are awake.

***Some brain parts need more fuel during sleep than when awake.***

However, we are still not sure exactly why we need sleep and what happens to our bodies and brain while asleep. Obviously some type of restoration is going on but, despite years of thorough

***No-one knows exactly why we sleep.***

neuro-chemical analyses and brain scans of different parts of the brain during sleep, we haven't been able to determine exactly what increases during sleep, to make up for a decrease during the waking hours. We do know that it is very complex and that almost every part of the brain becomes active at various times during a night's sleep. We also know that all living creatures need sleep and most seem to dream.<sup>15</sup>

### 1.14 How do we measure sleep?

Sleep is measured by sticking small, dome shaped electrodes to various parts of a person's head and face. The most important set of electrodes get temporarily stuck to the top of the head to measure *brain waves*, also called electroencephalography (EEG). The brain waves are the millivolts

<sup>13</sup> But see Q6.2 about dreams at sleep onset while in non-REM sleep

<sup>14</sup> See Q7.4 for information about wet dreams

<sup>15</sup> See Q7.20 for information on animal dreaming

that are constantly being emitted from our brain and these are amplified and printed out on paper or appear on a computer screen. From these brain waves we can basically tell all the different stages of sleep.

Earlier we saw that sleep is divided into Rapid Eye Movement (REM) sleep (typically associated with vivid, structured dreams)<sup>16</sup> and non-REM sleep. The non-REM part of sleep is in four stages, numbered from 1 to 4, with each stage being deeper sleep. Stage 1 is drowsy sleep when you would not be sure whether you were awake or not if someone touched you. Stage 4 is the deepest stage of sleep and if you were awoken from this stage you would be groggy and confused and possibly very grumpy. The deep sleep stages have big slow brain waves. However, stage 1 and REM sleep have very similar brain waves and we need to record two other measures to make sure that we don't get them mixed up.

***Our eyes roll around in their sockets as we drop off to sleep.***

The first is *eye movements*. When we are in REM sleep we have quite active eye movements fairly frequently and this is believed to have something to do with dreaming.<sup>17</sup> When we are in drowsy stage 1 sleep our eye movements show large gentle, rolling, wave like patterns. If you have ever been really tired but trying hard to stay awake you might have felt this slow rolling of the eyes. It looks very weird to others.

The other measure we need to get to see the difference between stage 1 drowsy sleep and REM sleep is *muscle tension*, usually recorded from the chin. In Chapter 1 we discussed how something amazing happens

***Recordings of muscle tension show a drop in REM sleep.***

<sup>16</sup> See Q1.11 and Q1.12 about the two parts of sleep.

<sup>17</sup> See Q6.7 and 7.9 about the visual aspect of dreaming

when we go into REM sleep. Our entire outer muscle system becomes paralysed. To stop us acting out our dreams our body becomes paralysed. The recording shows this as a major sudden drop in muscle tension and that confirms that we are in REM sleep. Sometimes this system doesn't work perfectly and not all the muscles are paralysed. When this happens people may start acting out part of their dreams, much to the distress of their bed partners. This is, however, unusual in teenagers.<sup>18</sup>

In a sleep clinic sleep is measured using the three different measures just described (brain waves, eye movements and muscle tension). The patient is also connected to various other devices to measure different things about breathing, heart rate and any possible muscle twitches in the legs. It's easy to wonder how people can sleep with all the wires. We know that sleep is changed a bit under these conditions but not too much in most people. Some people who can't sleep well in their own beds actually sleep better in a sleep clinic because they have learnt to associate their own bed with not sleeping and a new bed breaks that association.

***People can still sleep well when connected to 20-30 wires in a sleep clinic.***

### 1.15 How do sleep stages change across the night?

There are two important things that happen across a night's sleep. The first is that we go through the various sleep stages in five or six cycles, with each cycle lasting minutes.

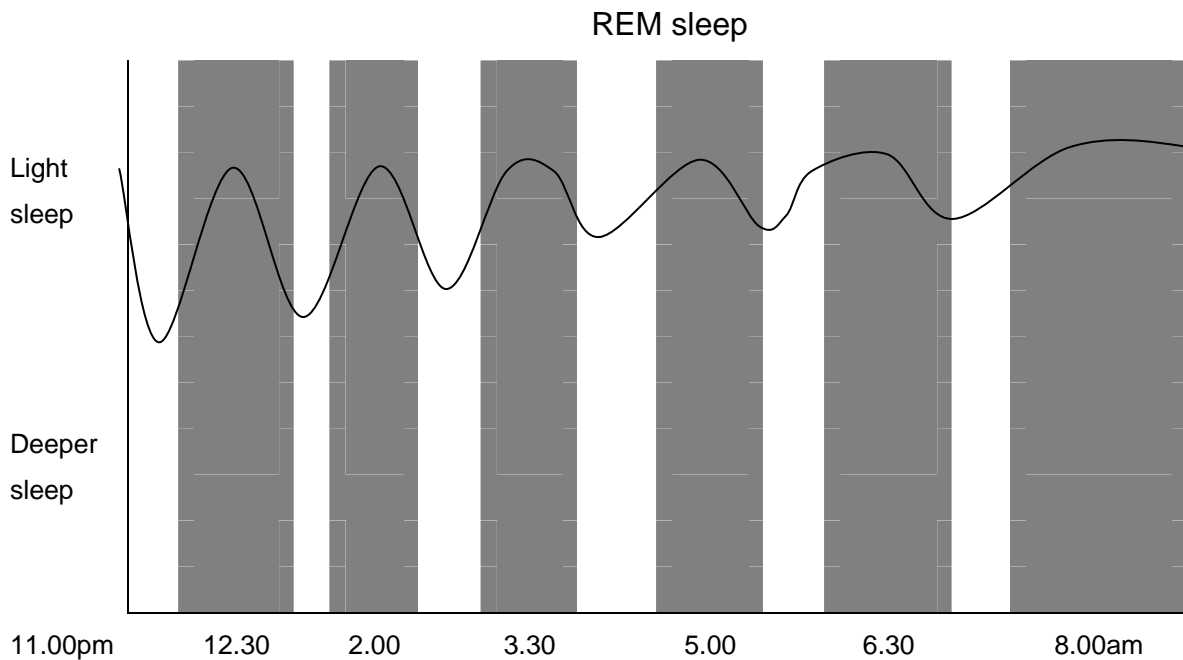
***Sleep changes in cycles across the night.***

cycle about 90 We can

think of each cycle having its middle point a period of REM sleep (see Figure 1.3). As the cycles go on across the night the amount of different types of sleep changes. In the first few cycles a young person will get

<sup>18</sup> See Q6.10 about REM sleep behaviour disorder and Q6.2 on muscle jerking at sleep

good amounts of deep sleep. Towards morning the cycles will have more and more REM sleep, considered to be a lighter stage of sleep. If awoken suddenly in the morning (such as with an alarm) it is quite likely the sleeper was in REM sleep, and this encourages the remembering of a dream.



**Figure 1.3:** Sleep cycles of lighter and deeper sleep across the night with cycles of REM sleep about every 90 minutes.

We usually wake up quite a few times during the night, especially as we move between REM sleep and different stages. We may move around a bit and go straight back to sleep, with no memory of awakening. If we didn't move during our sleep we would eventually have severe spinal degeneration.

***The average sleeper moves between 40 and 70 times every night.***

### 1.16 How do sleep stages change with age?

Babies obviously sleep a lot and about half of their sleep is REM sleep. The large amount of REM sleep in infancy has lead scientists to think that REM sleep has an important role in learning and brain development. The amount of REM gradually reduces and in adults REM sleep forms only about a quarter of our sleep. Children and teenagers get more deep sleep than other age groups and this gets less during adult life. Elderly people may get little or no deep sleep. Recent computer investigations of sleep patterns (power spectrum analyses) have shown that younger people have higher energy levels in the brain patterns during sleep than older people. This suggests that all stages of the sleep of children and teenagers are deeper and this presumably makes it harder to disturb their sleep.

***REM sleep has been recorded in unborn babies - we can only wonder if they are dreaming as we know it.***

### 1.17 Are some people deeper sleepers than others?

Some people seem by nature to be very deep sleepers and others wake to the slightest noises. In young people these individual differences are significant but it seems that age is equally important. We know that only about half of all children under 10 will wake up to a smoke alarm sounding right above their head. Teenagers are more likely to wake up as they get older (although definitely not to be relied on). Almost all adults will wake up easily to such noises. Waking up is more likely if not in a deep sleep. When catching up on some sleep (after being sleep deprived) the brain waves will have an increase in their 'power' (or depth) and it will be harder to wake up. Obviously, the loudness of the noise is important in determining whether it wakes up a sleeper or not, but people are also much more likely to wake up to a sound they consider significant. The sound of your own name will wake you up more easily than any other

***We never really shut off.***

name or noise at the same volume. This means that part of the brain is 'thinking' about the meaning of the sounds while it sleeps.

### 1.18 Why do we need deep sleep?

Deep sleep is important for young people as this is when growth hormone is released. It's also the type of sleep that the body gets first when it goes to sleep. There seems to be some pressure to get deep sleep and this becomes stronger the more hours people go without sleep. In recent times people have thought that this type of sleep is especially important for the body to replenish or restore itself. That is, it has a special role in reducing the *physical* aspects of tiredness, whereas REM sleep may be more related to cleaning up things in the brain. People who do a lot of physical exercise spend longer in deep sleep at night.

***Getting deep sleep helps you grow.***

### 1.19 Can we successfully wake up at a particular time without an alarm clock?

Many people claim that if they always set the alarm for a certain time, say 7.30 am, they will wake up just before the alarm goes off. One study looked at this issue and found that none of their participants were *always* able to wake up at the set time, although some did some of the time. Best results were when the person was in REM sleep at the time for waking up.

***An alarm is more reliable than your own sense of time when asleep.***

We think that being in REM sleep makes it more likely that the person will remember the intention to wake up. Perhaps the fact that different sleep stages happen in cycles means we are capable of keeping track of time in some approximate way. The fact that sleep stages are very predictable for an individual from one night to the next probably helps in knowing the time of a morning while you are asleep.

## 1.20 Why are we sometimes sleepy after lunch?

This is because the body clock causes changes in our bodies and makes us more likely to feel sleepy in the early to mid afternoon. (Here we are assuming a getting up time when most people have breakfast – not lunch.)

We can see the body clock at work by examining body temperature - it shows two dips across a 24 hour period, a small one after lunch and a big one during the night. The afternoon sleepiness happens whether we eat lunch or not but we are more likely to feel sleepy if we have had a big lunch or are sleep deprived. For a lot of people even a bit of alcohol makes them very sleepy at this time of day. In many countries, especially warmer ones, everything shuts down for a few hours after lunch for people to have a siesta (nap). We have all felt the sleepiness that comes with a hot day and these cultures indulge their body clock. But an afternoon nap may not always be a good idea.<sup>19</sup>

***A siesta is  
in  
harmony  
with our  
body  
clock.***

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<sup>19</sup> See Q5.15 for a discussion of napping

## ***CHAPTER 2: Problems of Teenage Sleep and Sleep***

### ***Medicine***

#### **2.1 How common are sleep problems in teenagers?**

The answer to this question depends on what we call a *sleep problem*. If we include a short-term difficulty with getting to sleep and staying asleep then we would have to say that almost all young people have a sleep problem sometime. However, we need a tighter definition. If we say the sleep problem must be considered to be *significant* by either the parents or the 'sleeper' then we estimate that at least 20-30% of all 12-20 year olds have a sleep problem at some stage. Because of the familiarity of many sleep difficulties or the on-again-off-again nature of some sleep problems it is unlikely that most of these parents or teens will ask for any kind of medical help. Sometimes that's the right thing to do. People use many ways to help their sleep, or they hope that they will just grow out of nightmares, sleep terrors, sleep walking and episodes of paralysis. They may blame excessive sleepiness on a range of other things happening in life.

***About a quarter of all teenage sleepers experience a significant sleep problem sometime.***

We know that many teenagers are not meeting their daily sleep need. The problem is both not getting enough hours of sleep as well as irregular timing of sleep.<sup>20</sup> This problem has been found in the young people of every country studied so far, including different ethnic populations (USA,

***About half of all teenagers say they are often sleepy during the day.***

<sup>20</sup> See Q1.2 about the timing of sleep



Australia, Brazil, Italy and Japan). Not getting enough sleep affects every part of the way we cope with life.<sup>21</sup>

Unusual behaviours that happen during sleep, called parasomnias<sup>22</sup>, are very common during adolescence, with over 80% of young people reporting parasomnias regularly. Table 2.1 presents information about how often different sleep complaints are reported. The responses are from a survey of 99 female high school students (aged 14-16 years) in Brazil.

Sleep changes between the ages of about 12 to 20 years of age. As teenagers get older they tend to get less sleep (especially on weekdays), go to bed later, have more trouble getting to sleep, have a greater difference between their weekday and weekend sleep patterns<sup>23</sup> and may take more daytime naps. As discussed throughout this e-book the irregular sleep patterns of many young people can have major consequences for the quality of their lives.

***Older teenagers report more sleep problems than younger ones.***

Professional help may be a good idea if a sleep problem goes on and is affecting overall health and wellbeing. In terms of sleep disorders that are diagnosed, we know that about 2% of children from infancy onward have sleep apnoea<sup>24</sup> (when breathing stops during sleep) or a related airway blockage.

***It's best not to ignore an ongoing sleep problem.***

<sup>21</sup> See Q1.6 to Q1.7 for the range of consequences of sleep deprivation

<sup>22</sup> See Chapter 6

<sup>23</sup> See Figure 1.2 in Q1.3 about different teenage sleep patterns on different days of the week.

<sup>24</sup> See Q3.10 for information on sleep apnoea

**Table 2.1:** Percentages reporting various sleep complaints.<sup>25</sup>

<b>Sleep complaint</b>	<b>% reporting this</b>
<b>Daytime sleepiness (more than once per week)</b>	45%
<b>Trouble falling asleep (more than once per week)</b>	14%
<b>Night wake ups (more than once per week)</b>	16%
<b>Nightmares (more than once per week)</b>	4%
<b>Sleep breathing problems (more than once per week)</b>	2%
<b>Moving a lot during sleep (habitually)</b>	70%
<b>Sleep talking (habitually)</b>	32%
<b>Leg movements (habitually)</b>	10%
<b>Sleepwalking (habitually)</b>	8%
<b>Teeth grinding (habitually)</b>	8%
<b>Snoring (habitually)</b>	5%
<b>Head bumping (habitually)</b>	5%
<b>Screaming (habitually)</b>	3%

Perhaps as many as one adult in every 1,000 people has a condition of daytime sleepiness called narcolepsy<sup>26</sup>, which tends to start during young adulthood. Interestingly, the percentages of people who go to a sleep clinic and are diagnosed with problems such as chronic insomnia (ongoing

<sup>25</sup> Data from Andrade and Menna-Barreto (2001) pp118-131.

<sup>26</sup> See Q5.10 for information on narcolepsy

trouble sleeping), nightmares, sleep paralysis and sleep walking, depends on how many sleep clinics exist in a particular area! This is not to trivialise these problems, which can have serious life effects. What it shows is that lots of people will take up opportunities for help if they are readily available. If they are not, they often just learn to live with it. But this is not always in everyone's best interests. Many people have felt cheated through having to live for years with an undiagnosed or misdiagnosed sleep problem.

## 2.2 Do teenage boys and girls have different sleep experiences?

Girls tend to have more problems falling asleep, wake up more often and for longer during the night and have more early morning awakenings than boys. Girls may go to bed a bit earlier than boys but the overall amount of sleep obtained is about the same. A large survey involving over 6,000 Italian high school students (aged 14 to 20 years) found the percentages as set out in Table 2.2.

***Girls report more sleep problems than boys.***

## 2.3 Are some teenagers more at risk than others?

There are several groups of teenagers who are more at risk for sleep problems than others. Firstly, those that keep irregular hours with their sleep times changing from day to day can develop real problems. These people may go to bed at 3am one night and 8pm the next. They may spend 3 hours in bed in one 24 hour period and 14 hours in another such period. This may have started out for reasons like social activities, odd work hours, exam stress or a period of emotional trauma. But then ongoing sleep and what we call 'body rhythm' problems develop and drive their irregular hours<sup>27</sup>.

<sup>27</sup> See Q3.8 on timing problems in sleep

**Table 2.2** Sleep difficulties and experiences; boys versus girls.<sup>28</sup>

	% Boys	% Girls
Early morning awakening	21%	25%
Trouble falling asleep	20%	22%
Report being a 'poor sleeper'	17%	21%
Waking up many times	8%	11.5%
Long night awakenings	4%	7%
Using substances to help sleep (16 yr olds)	2%	5.8%

Teenagers who find they easily get stressed or have a lot of stressful events happen to them can develop sleep difficulties.<sup>29</sup> The idea that certain people who are special may be 'sensitive' and thus have more trouble getting a good night's sleep is first presented to many children through a fairy tale (see Box 2.1). We know of course, that insomnia can affect all sorts of people, for all sorts of reasons. It would be rare to find an adult who can truthfully say they always sleep well every night.

***Almost everyone has experienced a bad night's sleep.***

Eating, drinking or smoking anything that affects the way you feel can affect your sleep. Caffeine is the one that most people think of first as stopping sleep and some people are more sensitive to its effects than others. Tobacco, alcohol, illegal 'recreational' drugs and antidepressants all affect sleep<sup>30</sup>. Often the active ingredients in tablets against allergies, pain, nicotine addiction, coughs, colds and flu can change your sleep.

***All mood altering drugs alter sleep.***

<sup>28</sup> Data from Giannotti and Cortesi (2002) pp.132-147.  
<sup>29</sup> See Q4.3 on emotional problems and sleep and Q3.14 on stress effects

**Box 2.1:** From Hans Christian Andersen's "The Pea and the Princess"

*A prince is known to looking for a wife. A young girl comes to the castle gate, pretending to be a princess. The aged queen sets up a test for the young girl, taking her to a bedroom for the night. Secretly she hides a single pea under twenty mattresses and twenty eiderdowns. In the morning the young girl complains: "I hardly shut my eyes the whole night! Heaven knows what there was in the bed! I was lying on something hard. I am black and blue all over! It's quite dreadful!" Then they all knew that she was a real princess because she had felt the pea despite the twenty mattresses and twenty eiderdowns on top of it. Only a real princess could be so sensitive.*

It seems that for some people their sleep problem may be linked to a family history of the same sleep problem. At this stage of what we know about genetics it seems that nearly all the sleep disorders can potentially run in families. But if we question people who we know have a diagnosed sleep problem, we find that only a very small percentage know of a family member with the same problem. So for most cases of sleep disorders, a family history of the same problem either does not exist or is not known about. On the other hand, if a close family member has a sleep disorder and a young person is starting to show similar sleep related changes it would be a good idea to take them seriously. New research suggests that some, quite subtle, things about sleep may be under genetic control. The sleep of identical twins is much more similar in terms of patterns of sleep and body movements than the sleep of non identical twins (who share less genetic material). Dreams may even run in families.<sup>31</sup>

Other groups who may be more at risk for sleep problems are young people who have developed a physical illness and those with a psychiatric

<sup>30</sup> See Q3.3 to Q3.6 for the more about the effects of some of these substances on sleep

<sup>31</sup> See Box 7.9 in Q7.14 about some reported identical dreams in identical twins

illness. People who are noisy breathers and have sleep problems need to consider the possibility of sleep apnoea.<sup>32</sup>

## 2.4 How is sleep affected by physical illnesses?

Being sick in bed for days on end can mean that sleep becomes a series of naps and then it's harder to get a single long block of sleep at night even when the patient is feeling better and up and about. Some tablets or medications will have major effects on sleep and a few types can lead to vivid dreaming or nightmares. Sometimes stopping medications can cause sleep disruption.<sup>33</sup> Spending time in hospital may induce a different sleep-wake pattern (such as having to wake up early) causing changes to body rhythms.<sup>34</sup> The effects are a bit like jet lag and may continue for sometime afterwards. The poor sleep that may start with an illness may keep going long after the illness is over.<sup>35</sup>

***The experience of a physical illness has a big effect on your sleep and wake patterns.***

Burn injuries, dermatitis and arthritis may make nights very uncomfortable or painful. Asthma and epilepsy may be worse at night and affect sleep.

Airways may become partially closed with the relaxation of drifting off to sleep, causing breathing problems,<sup>36</sup> which not only affects how much oxygen is obtained but also how deep the sleep is. This is a serious problem that needs medical help and some conditions like obesity, neuromuscular illness and cerebral palsy make people more likely to have such problems.

***Poor sleep can become a habit.***

<sup>32</sup> See Q3.10 for information about sleep apnoea

<sup>33</sup> see Box 4.4 in Q4.7 for information on REM rebound

<sup>34</sup> See Q1.2 for more on body rhythms

<sup>35</sup> See Q3.18 on how poor sleep can become a habit

<sup>36</sup> See Q3.9 and Q3.10 for more on breathing problems and sleep apnoea

Being infected with certain types of bacteria and viruses can increase the desire for sleep, especially in the first few days. We know that sleep helps combat severe infections and improves the immune response.

**Sleep  
helps  
fight  
illness**

In attention deficit hyperactivity disorder (ADHD) improvements in sleep lead to better behaviour. ADHD is treated with tablets that are stimulants and these can disturb night time sleep if the tablets are taken too late in the day.

In some children or teenagers the behaviours that lead to the diagnosis of ADHD may be linked to sleep disorders that no one knows they actually have, such as periodic limb movements,<sup>37</sup> obstructive sleep apnoea<sup>38</sup> and body rhythm disturbances.<sup>39</sup> Even snoring in children has been linked to more problems such as paying attention to work and poorer memory.

**For some,  
hyperactivity  
may be due  
to a sleep  
problem.**

Some physical illnesses can make a person feel as if they have a sleep problem and it is usual to check for such illnesses before considering a possible sleep disorder.<sup>40</sup>

## **2.5 Is Chronic Fatigue Syndrome a sleep disorder?**

No, Chronic Fatigue Syndrome (CFS) is a physical illness that is often hard to define and can be hard to distinguish from a sleep problem. People with CFS feel unexplained fatigue lasting 6 months or more. In some cases, but not all, it can start after an illness such as a virus, flu, severe cold, gastroenteritis, glandular fever or hepatitis. Fatigue is

<sup>37</sup> See Q3.11 for details on periodic limb movement disorder

<sup>38</sup> See Q3.10 about sleep apnoea

<sup>39</sup> See Q3.8 about delayed sleep phase disorder

<sup>40</sup> See Q5.3 for different things that can cause ongoing sleepiness

different to sleepiness (sleepiness is the desire to go to sleep); it is more like feeling exhausted mentally and physically. In CFS muscle aches and pains are usual, concentration and memory can be worse than normal, a sore throat and headaches are common and irritability, depression and mood swings occur. People with CFS are likely to wake up a lot from their sleep. Their restless nights make their daytime weariness worse. CFS may be hard to distinguish from depression<sup>41</sup> or the sleep disorder of narcolepsy.<sup>42</sup>

**Chronic  
Fatigue  
Syndrome  
can look  
like a  
sleep  
disorder.**

### Case Study 2.1

Jessica developed glandular fever when she was in her final year of high school. It took a while to diagnose and she felt dreadful for weeks. She had to get special permission to get her high school certificate without doing the exams. She had no energy at all, couldn't finish anything she started and began to suffer a lot from headaches. When she started being out of bed more often she found that she couldn't walk much without feeling sore and everyone said this was probably because she had been in bed so long and her muscles were out of use. But, despite a careful program of gentle exercise, she didn't seem to get any better; in fact she thought she was feeling worse. The hardest part was feeling tired all the time. She decided to defer her place in a commerce course for a year and see if she could get some work experience in an office. As the summer ended her parents put more and more pressure on her to get out and find a job. She wanted to, but had no energy to do much at all. Every day Jessica would get up late, drag herself around for a few hours and then have an afternoon sleep. Everyone started to think she was either lazy or depressed. She did feel a bit low but not teary, upset or particularly sad. She slept badly at night, seemed to have lots of headaches, sore aches and pains in her legs and arms and a desire to lie down during the day for a rest or a nap. One of Jessica's friends, Amy, saw a TV program on narcolepsy, a sleep disorder where you feel sleepy during the day a lot. Amy convinced Jessica's mum to take her to the doctor to see if this is what she had. The doctor seemed doubtful about the possibility of narcolepsy and did blood tests to check for anaemia and thyroid problems. When the tests were normal he referred her to a specialist who did lots of

<sup>41</sup> See Q3.15 for information on depression and sleep

<sup>42</sup> See Q5.10 for details of narcolepsy



different tests and decided that it was most likely that Jessica had developed Chronic Fatigue Syndrome after her glandular fever. The specialist said that she would gradually start to feel better but it was hard to say how long her symptoms would last.

## 2.6 Do mental illnesses affect sleep?

In answering this question we will consider the psychiatric problems of schizophrenia, obsessive compulsive disorder, manic depression and anorexia nervosa and leave the problems of anxiety and depression to be discussed later in Chapter 4.<sup>43</sup> This is because anxiety and depression are so common and vary in intensity from simply being described as 'stress' to major clinical illnesses requiring specialised care and it makes more sense to talk about the mild and severe forms all together.

Psychiatric problems are much more likely to be associated with disturbed night sleep than excessive daytime sleepiness –

although sleepiness during the day may be a result of a poor night's sleep. Spending a lot of time in bed may be a reaction to not coping well with life (see depression<sup>44</sup>).

A person with schizophrenia is likely to have poor sleep, especially before and during a psychotic episode. They will take longer to go to sleep, awaken more frequently and get less sleep per night. Their bizarre thoughts may resemble dreams and their dreams are more likely to feature unfamiliar people and experiences.

**Strangers  
feature  
more in  
dreams  
during a  
psychotic  
episode.**

<sup>43</sup> See Q4.3

<sup>44</sup> See Q3.15 for information on depression

Manic depression is where the person has episodes of mania (intense, frenetic activity) at certain times and depression at other times. During a manic phase their normal sleep pattern changes in a major way, as do other daily rhythms. Surprisingly, getting less sleep can elevate their mood and this can set up a cycle of increasingly manic behaviour and very little, or no, sleep. A manic episode can lead to major exhaustion.

**Stopping medication often affects sleep for a while.**

In obsessive compulsive disorder going to bed may be associated with a series of elaborate and unusual bedtime rituals (such as rearranging all the soft toys in their room or repeatedly checking that all the doors in their house are locked). These can delay going to sleep a lot. Once asleep they may wake up quite often and get less deep sleep.

Anorexia nervosa is an eating disorder that also leads to sleep problems, although people with this disorder tend not to complain much about their sleep. They often wake up early in the morning, similar to most people with clinical depression. People with anorexia tend to have vivid dreams about food and become anxious in their dreams that they are eating too much. As they lose weight their sleep time decreases and they wake up more often. This improves again when they gain weight.

**In anorexia eating less means sleeping less.**

Medications taken to alter mood, or for a psychiatric condition (such as antipsychotics, antidepressants, mood stabilisers, and neuroleptics), can have disruptive effects on sleep. In some cases they can induce unusual behaviours during sleep, notably nightmares. The effects of mood altering drugs vary depending on the type but they often tend to make people fall asleep quickly, increase the time spent asleep and increase the amount of deep

sleep. In some cases they may make people sleepy during the day. Similarly, anticonvulsant medication (taken for epilepsy) and antihistamines (taken for allergies like hay fever) may cause drowsiness. Coming off many sleep-inducing medications may lead to restless sleep and more intense dreams until the effects have worn off.<sup>45</sup>

## 2.7 What is sleep medicine?

Sleep medicine is a branch of medicine that has developed rapidly since the 1980s and normally operates through a sleep clinic facility. The number of sleep clinics in the western world has dramatically increased, from a handful to many thousands, in just twenty years. Sleep medicine is usually practiced by a team of specialists from different backgrounds including respiratory physicians (for the breathing problems that may occur during sleep), neurologists (for neurological sleep conditions such as narcolepsy) and psychologists (for a range of sleep troubles). In some clinics chrono-biologists may also work with people whose sleep problems result from body rhythm disturbances. In a sleep clinic a night's sleep is recorded and many different measures such as brain waves and breathing are monitored all night.<sup>46</sup> Sometimes the measurements show what the real problem is that is disturbing sleep and other times the recordings will be used to rule out possible physical reasons for a sleep problem. In such cases the patient may work with the psychologist to try to improve sleep quality.

***Sleep medicine involves specialists from many different areas.***

<sup>45</sup> See Box 4.4 in Q4.7 about REM rebound

<sup>46</sup> See Q1.14 on how sleep is measured using electrodes

## 2.8 What are the main types of sleep disorders?

The main types of sleep disorders are very straightforward. Firstly, we have disorders that relate to *getting to sleep or staying asleep*<sup>47</sup> and this is the area where most people experience their problems. Then we have problems related to *sleeping too much and daytime sleepiness*,<sup>48</sup> and this can be caused by night problems that the sleeper is unaware of or some medical conditions. Both of these types of problems can happen when people get sleep at the wrong time of day due to their body rhythm being disrupted. Many teenagers have disturbed body clocks. The third major type is the *events and behaviours that happen at sleep onset or during sleep*. Here we see a wide range of things that can happen while we sleep such as jerks, hallucinations, paralysis, snoring, restless legs, sleep walking, night terrors, binge eating at night and wet dreams.<sup>49</sup>

***Most sleep problems, but not all, involve insufficient sleep.***

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<sup>47</sup> See Chapters 3 and 4

<sup>48</sup> See Chapter 5.

<sup>49</sup> See Chapter 6.

## ***CHAPTER 3: Trouble getting to sleep or staying asleep –***

### ***Why?***

#### **3.1 What is insomnia and how do we know when it's present?**

Insomnia is basically having trouble getting to sleep or staying asleep and it is said a person 'has it' if it lasts for more than three weeks. But insomnia is normally not like an illness, such as diabetes, with a particular cause within the body (not making insulin) that produces the symptoms of weakness, thirst and so on. Insomnia is normally a *symptom* itself telling us that something that is going on, while awake, is causing problems sleeping. It is not accurate or helpful to think of someone as having 'insomnia' - although it might have good sympathy value when they are talking to friends or family. The attitude to a sleep problem may be the most important thing in determining how quickly it is solved. It is unhelpful for someone to think of themselves as being an insomniac and it will probably only make their sleep worse. It is better for them to think of themselves as going through a time of 'poor sleep' and try to be a detective and find out why.

***Try to find out what is happening when awake that gives trouble when wanting to be asleep.***

It is obvious if someone is having poor sleep as it affects the way they feel during the day. A series of nights of less than enough sleep is a problem if it causes feelings of tiredness, irritability and moodiness with poor memory and concentration.<sup>50</sup> If someone lies in bed every night for over an hour before getting to sleep but feel fine during the day, then they

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<sup>50</sup> See Q1.5 to Q1.7 for a discussion of the consequences of insufficient sleep

aren't a poor sleeper, they are going to bed too early. If they feel refreshed half an hour after waking up they are getting enough sleep.

If sleep patterns are a problem for you or someone you want to help, work through the series of questions in this chapter and see which things might apply either a lot or a bit. Identifying the cause of poor sleep enables something to be done about it. There are lots of helpful ideas to improve sleep in the next chapter.

***Take a problem solving approach to sleep difficulties.***

If it is suspected that the poor sleep may be due to a physical illness, Chronic Fatigue Syndrome or a psychiatric illness like schizophrenia or anorexia then see Chapter 2.<sup>51</sup>

People are often interested in seeing how their own problems rate on a scale developed by the experts in an area. Appendix B contains a questionnaire about sleep quality that gives an overall score. Doing the questions before and after a poor sleeper has spent a month or two trying to fix their sleep can monitor progress.

### **3.2 Are we good at judging the difference between sleep and wake?**

No, many of us are not good at correctly saying whether we have been asleep or not when asked during the night. Some people will say they are awake even when the sleep record clearly shows they have been asleep. Or, if they have just woken up in the middle of the night they may think they have been awake for ages. Poor sleepers are the ones most likely to say that they were awake (when really asleep) or

***Poor sleepers actually sleep better than they think they do.***

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<sup>51</sup> Especially Q2.5 to Q2.6

over estimate how long they were awake for during the night. Many people are not aware that the mind remains active all night long and think the thoughts they have been having are because they are awake. However, we have a continuous flow of thoughts during sleep. In some cases poor sleepers may actually be dreaming that they are awake. Thinking one is awake while really asleep is called *sleep misperception* and it's a very common problem. A person who is fairly anxious by nature has a higher level of arousal all the time (even when asleep) and this may be causing sleep misperception. Poor sleepers may make their sleep problem worse because they then worry about not getting enough sleep. Almost every sleep record ever made of a poor sleeper shows them to be actually getting more sleep than they think they are. Knowing this can have a strong reassurance value for people who dread going to bed because of sleeplessness.

### 3.3 What does caffeine do to sleep?

Caffeine is a stimulant that we find in coffee, cocoa, chocolate, cola drinks and a range of newer soft drinks such as Jolt, V drink, Red Bull and Liftplus. Some students take caffeine tablets to keep them awake, especially at exam time. One problem with such stimulants is that they give more confidence but reduce the ability to be critical. In other words you write something you think is marvellous at the time and then the next day see it with all its flaws.

Caffeine remains active in the body for quite a few hours and its effects can build up the more that is consumed. People can become caffeine dependent and then develop headaches if they go without caffeine.

Young people who drink coffee are twice as likely to report trouble falling asleep than those who don't. Poor sleepers who have lots of caffeine should gradually cut it down or stop it

***Poor sleepers need less or no caffeine in their bodies.***

altogether.

Table 3.1 enables calculation of caffeine intake in any one day. Add the units up and consider a reduced intake if lots of caffeine is being consumed (especially if close to or over 20 units) and sleep is poor. Consumption in the evening is especially likely to cause problems.

**Table 3.1:** Number of units in different caffeine containing drinks and foods<sup>52</sup>

	Units*
1 small cup instant coffee (150 ml)	3 - 4
1 small cup tea	1 - 2
1 small cup brewed / percolated coffee	5 - 8
1 small cup cocoa	1
1 small bar chocolate (100g)	2
1 small can Cola soft drink (330 ml)	2 - 3
1 'Energy' soft drink with caffeine (330 ml)	3 - 8

*\*More than 20 units a day will disrupt your sleep*

### 3.4 What does alcohol do to sleep?

Alcohol changes sleep. Having more than a few glasses will affect sleep, causing more awakenings in the second half of the night and feeling less rested than usual. Binge drinking to the point of being really drunk when falling into bed, can result in poor sleep for up to a week, even if no more is drunk during that time. We don't know why this is but it seems that some of the body changes that allow us

**Getting drunk can affect sleep for many days.**

to fall asleep and stay asleep are disrupted by getting drunk. It's possible that a disruption in the secretion of the hormone melatonin<sup>53</sup> may be

<sup>52</sup> Adapted from Shapiro (1993)

<sup>53</sup> See Q1.2 for information on melatonin



involved. Alcoholics sleep like elderly people. They wake up often, have very little deep sleep and are often sleepy during the day.

Alcohol can seem like a sleeping potion, making it easier to fall asleep. This may be the case for small amounts of alcohol but this only works for a while (we become tolerant to its effects). Alcohol reduces the amount of REM. With a moderate amount of alcohol this reduction of REM wears off after a few hours and a *REM rebound*<sup>54</sup> is experienced in the second part of the night - in other words more REM than normal. This means dreams can become intense and cause awakenings (that the sleeper may or may not be aware of). A large amount of alcohol will lead to REM rebound and withdrawal effects over the next few nights of sleep.

Another effect of alcohol is that it is a diuretic, leading to the need to get up and use the bathroom a lot during the night. It also affects breathing during sleep. More effort is required to breathe normally when asleep after having alcohol and it can cause nasal congestion, which may then be associated with a morning headache (perhaps in addition to a hangover headache). Snoring is more likely and some people experience episodes of sleep apnoea<sup>55</sup> (trouble breathing and sleeping at the same time) after drinking. Limbs may twitch a lot during sleep<sup>56</sup> after drinking alcohol and this can make sleep more disrupted. Even social drinkers of alcohol can become deficient in magnesium and this can reduce the ability to get to sleep.<sup>57</sup>

Some people think that having a caffeine drink can help counteract the effects of alcohol. This is *not* the case for driving

***Alcoholic drinks cause snoring, nasal congestion, muscle twitching and more toilet visits during sleep.***

<sup>54</sup> See Box 4.4 in Q4.7 for details on REM rebound

<sup>55</sup> see Q3.10 about sleep apnoea

<sup>56</sup> see Q3.11 about periodic limbs movement in sleep

<sup>57</sup> see Q4.4 for information on vitamin and mineral supplements to help sleep.

performance. Drinking alcohol affects the ability to drive and having caffeine makes no difference to this ability although it will reduce the chance of falling asleep at the wheel. In terms of getting a good night's sleep, caffeine and alcohol interact with each other to worsen sleep.

### **3.5 What does tobacco do to sleep?**

Lots of people find it hard to believe that smoking can affect sleep. It's true. Nicotine is a stimulant and can increase how long it takes to fall asleep. Duration of sleep and quality of sleep will be less. Some people are more affected by this than others. Cigarettes (as well as pipes and cigars) make it harder to get a good night's sleep. Smoking before bedtime has a pep up effect. For some people being an addicted cigarette smoker affects their sleep because they have nicotine withdrawal effects during the night. One major effect of giving up smoking is disrupted sleep until the body adjusts to a life without nicotine.

### **3.6 How do illegal drugs affect our sleep?<sup>58</sup>**

Most drugs (legal<sup>59</sup> or illegal) can cause sleepiness during the day, either by fragmenting night time sleep or by actually causing sleepiness. This may be a consequence of being under the influence of the drug itself (stimulant or sedative effect) or when withdrawing from the drug, or both (depending on the drug).

The active part of marijuana or cannabis, THC, is a sedative. THC reduces the amount of REM sleep when it is active, so when the effect of the drug is wearing off it a REM rebound<sup>60</sup> occurs. This means having more than the usual amount of REM sleep, often resulting in disrupted sleep from intense dreaming. Withdrawal from ongoing use will also result

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<sup>58</sup> See Q1.8 for information on psychotropic drugs, including antidepressants.

<sup>59</sup> See Q4.7 for information on sleeping tablets

<sup>60</sup> See Box 4.4 in Q4.7 for details on REM rebound

in anxiety and possibly have an anorexic affect (not eating). People who use marijuana frequently have an increase in their total time spent asleep and feel more lethargic or even drowsy when awake.

Amphetamines, cocaine and ecstasy are all related in terms of their effects on sleep. They are stimulants that reduce time spent asleep and increase how long it takes to go to sleep. As they reduce the amount of REM sleep, withdrawal again means experiencing a REM rebound, with dreaming that may disrupt sleep. Ongoing use of stimulants can be associated with sleep deprivation. Coming off these drugs is often associated with mood changes, especially depression. Heroin and morphine are opiates and they have similar effects on sleep to the stimulants just described.

***Withdrawal from many illegal drugs can induce nightmares and mood changes.***

Young people who regularly don't get enough sleep are more likely to take illegal drugs than those that do get enough sleep. We don't know why these things sometimes go together. Perhaps it's because a lack of sleep affects our mood in an unpleasant way and therefore mood altering drugs seem more attractive in the short term.

### **3.7 What are the effects of erratic sleep-wake times?**

An erratic lifestyle can mean that the amount of sleep varies a lot from day to day. This is one of the most common sleep problems in teenagers. For the first time in their lives their bedtimes start to be more up to them.

There can be excellent social opportunities that they don't want to miss out on and sleep is seen as something that can always be caught up on later. This means that body rhythms get completely mixed up. Then when they want to get a good night's sleep they may not be able to because their body rhythm is not on the 'Let's go to sleep now' setting. They may have to wait hours for this and meanwhile they toss and turn.

Often sleep will improve when a person adopts a more regular lifestyle but some erratic sleepers develop an ongoing problem with their cycles of sleep and wake times. This is discussed in the next question.

***Quality sleep depends on being in tune with the body rhythm.***

### **3.8 Can the problem just be with the *timing* of sleep, rather than sleep itself?**

The answer to this is yes, and to understand why we need to think about body rhythms.<sup>61</sup> It is one of the quirks of nature that in most people our daily sleep and wake body rhythm would run on a 25 hour cycle (not 24 hour) if it were not constantly reset. Our body clock wants us to go to bed later each night unless we keep resetting it. It is reset by the light and dark changes of our environment and other cues like meal times and social activities. Because it is constantly reset we only know that it runs a bit longer than it should by studying people put in ‘bunkers’ for months where there is no natural light and they choose their own bedtimes and routines.

***Our body clock is always being reset.***

In some people their body rhythm is *not* being reset all the time by one hour. This means that they want to go to bed every night one hour later than they did the night before. So when they can choose their bedtimes it looks like the first seven days of the sleep diary in Box 3.1. (Note that in this diary an arrow shows whether they got into or out of bed and the shading indicates sleep.) We call this a *free running* body rhythm. If they are living in a world of people who are awake from 7am till 11pm and sleep from 11pm to 7am, they are soon sleeping when everyone else is

<sup>61</sup> See Q1.2 for general information on body rhythms, the body clock in the brain and resetting rhythms for summer time and with jet lag

awake. When they try to keep to a 24 hour schedule and get up at a constant time, they have real problems. They can't fall asleep when they should, they have to get up when they may just be starting to get a bit of solid deep sleep and then they are sleepy at various times across the day. (See the second seven days of Box 3.1.)

Teenage sleep

**Box 3.1** The sleep diary of Ruby. First 7 days free running, second 7 days fragmented when trying to keep constant 8am getting up time.



	DAY	DATE	8PM	9PM	10PM	11PM	MID-NIGHT	1AM	2AM	3AM	4AM	5AM	6AM	7AM	8AM	9AM	10AM	11AM	NOON	1PM	2PM	3PM	4PM	5PM	6PM	7PM	8PM		
1	Mon		■				■	■	■	■	■	■	■	■	■													■	
2	Tue		■					■	■	■	■	■	■	■	■	■													■
3	Wed		■						■	■	■	■	■	■	■	■	■												■
4	Thu		■							■	■	■	■	■	■	■	■	■											■
5	Fri		■								■	■	■	■	■	■	■	■	■										■
6	Sat		■									■	■	■	■	■	■	■	■	■	■								■
7	Sun		■										■	■	■	■	■	■	■	■	■	■							■
8	Mon		■								■		■	■	■	■									■	■			■
9	Tue		■									■		■	■	■								■	■	■			■
10	Wed		■								■		■	■	■									■	■				■
11	Thu		■									■	■	■	■									■	■	■			■
12	Fri		■							■	■		■	■	■										■	■			■
13	Sat		■								■	■		■	■	■									■	■			■



In a small group of people such a free running rhythm is actually a disorder caused by an internal body clock problem. In some blind people the pathway from their eyes to the body clock is blocked, causing a free running rhythm. However, many people, especially teenagers, can have such erratic lifestyles that the cues they need to reset the body clock every day (from its desire to run at 25 hours) are not strong enough. The main cues needed are outdoor light, regular meals and regular sleep times.

***The body clock thrives on regular sunshine, meals and sleep.***

When such people don't have to follow a routine they may just let the clock run and sleep will be unproblematic. However, when a regular routine is needed the sleep problems start. They have trouble getting to sleep but once asleep usually sleep well. They feel as if they are only half way through their night's sleep when the alarm goes off and they may be groggy for hours once they get up. They may be sleepy during the day and only start to be alert towards evening. On weekends and holidays they love to sleep in late. Their weekday routine may have stopped their body clock free running but their rhythm is wrong. It is delayed. This sleep problem is called *delayed sleep phase syndrome*. Sometimes, but not always, young people with this problem also have other problems like depression, poorer health and general trouble coping. Fixing the sleep problem is through something called chronotherapy<sup>62</sup> discussed in the next chapter. If there are other problems as well, like depression, these should not be ignored.<sup>63</sup>

***The body clock can become set at the wrong time of day for sleep.***

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<sup>62</sup> See Box 3.5 in Q3.16

<sup>63</sup> See Q3.16 for details on how depression can affect sleep

Keeping a sleep diary of times of being awake and asleep is a good idea if body clock problems may be an issue. Box 3.2 shows the sleep patterns of a person with a sleep phase delay of about three hours. He is normally getting to sleep at about 2 am, although he may have been in bed for hours before this time. As he needs to get up at 7 am we would expect him to go to sleep around 11pm, three hours earlier. A blank diary sheet can be found in Appendix D.

***A sleep diary  
will show  
what the body  
rhythm is  
doing.***



**Box 3.2** The sleep diary of Sam, who has a phase delay of about 3 hours meaning his normal sleep pattern starts at 2am- although he may have been in bed for several hours by this time



	DAY	DATE	8PM	9PM	10PM	11PM	MID-NIGHT	1AM	2AM	3AM	4AM	5AM	6AM	7AM	8AM	9AM	10AM	11AM	NOON	1PM	2PM	3PM	4PM	5PM	6PM	7PM	8PM
1	Mon																										
2	Tue																										
3	Wed																										
4	Thu																										
5	Fri																										
6	Sat																										
7	Sun																										
8	Mon																										
9	Tue																										
10	Wed																										
11	Thu																										
12	Fri																										
13	Sat																										
14	Sun																										

### 3.9 Is being a noisy breather or snorer a problem for good sleep?

It is very common for people to complain about others being noisy breathers during sleep. It may not be a problem for the sleeper but people tend to be sensitive about being called a snorer and deny it – which doesn't make any sense because they are asleep when it happens. One survey found that 5% of high school students reported snoring, but the true rate may be higher than this. Snoring is not a sleep problem in itself, although some snorers have lighter and more restless sleep than non-snorers (perhaps through repeatedly being partially aroused by their own noises). Tips to help with snoring are discussed later.<sup>64</sup>

Perhaps 20% to 30% of habitual snorers have breathing problems during sleep that should be checked out by a doctor. Reports from others that breathing is stopping for several seconds or more should be taken seriously. Stopping and restarting breathing is often accompanied by grunting or

***Some snorers sometimes stop breathing while asleep.***

snorting noises, restless sleep and possibly more sweating than usual. The struggle for air may or may not wake up the sleeper. Breathing problems cause frequent changes from normal sleep to a light sleep (that the sleeper is not aware of) or awakenings. The sleep disorder where people stop breathing at intervals during the night is called sleep apnoea. While this is often associated with snoring, this is not always so and any noisy breathing should be monitored by family or friends to see if breathing is being interrupted.

<sup>64</sup> See Q4.8 about treatments for snoring

### 3.10 What are the causes and consequences of sleep apnoea?

Sleep apnoea can be caused by large tonsils and adenoids (spongy tissue between the back of the nose and throat), being overweight or having a minor or major facial abnormality that may change the size of airways. These can be as minor as a small chin or a large tongue. A large neck circumference suggests a high risk of sleep apnoea. Sleep apnoea is well documented in children and adults but there is some suggestion it may be less common in teenagers due to changes in the shape of tonsils and adenoids at that age. In children it equally affects boys and girls but in adults it is four times more likely in males. Being overweight greatly increases the chances of having sleep apnoea, as does smoking, drinking alcohol and taking sedatives.

***Sleep apnoea can be a result of an unhealthy lifestyle.***

The immediate consequences of sleep apnoea are that in the morning the sleeper may have a dry mouth, a headache and feel as if they have not slept at all well. During the day they may feel sleepy, irritable and have trouble concentrating and this is because their sleep has continually been interrupted by the need to wake up a bit in order to breathe properly. Sleepers are usually unaware of these many minor awakenings.

Undiagnosed sleep apnoea in students can lead to poor school grades, depression-like symptoms and in some cases, hyperactive behaviour. See Case Study 3.1.<sup>65</sup>

It is very important that suspected sleep apnoea is checked out. The GP is the first person to see and a referral to a sleep clinic may follow.<sup>66</sup> Untreated sleep apnoea increases the risk of health problems later in life

***Suspected sleep apnoea needs medical attention.***

<sup>65</sup> Case Study 3.1 is in Q3.13

<sup>66</sup> See Q4.8 about sleep medicine and sleep clinics

such as high blood pressure, stroke and heart attack. Very severe cases where people can't sleep and breathe at the same time have been documented. Some people have died during their sleep due to not getting oxygen and some cases of Sudden Infant Death Syndrome are babies with sleep apnoea.

### 3.11 What if your limbs feel restless before sleep?

Some people get a very unpleasant sensation in their legs while they are awake and sitting down during the evening or while trying to go to sleep. The sensation has been described as; creeping, crawling, tingling, aching, burning, pulling, stretching, and heavy itching. There is a strong urge to move the legs. The feeling is usually around the knees and below the knees although occasionally the upper legs are also affected. It does not affect the feet, hands or arms. This is called 'restless legs' disorder and affects males and females equally. It can happen at any age, including childhood and affects 5% to 15% of adults.

***“It’s like having worms or insects inside the legs.”***

The things that make restless legs more likely are a deficiency of iron or magnesium, sleep deprivation or the intake of substances like caffeine, stimulants, antidepressants or alcohol. In girls and women it can occur before a menstrual period and during pregnancy. Moving the legs can help, as can massage or cooling. Treatment involves getting plenty of sleep regularly, avoiding taking substances that make it worse and ensuring you are getting enough iron and magnesium. If the problem is very bad there are some medications that will help but the non medical suggestions usually work.

Many people with restless legs disorder also have their sleep disturbed by their limbs jerking during sleep (periodic limb movements in sleep), which they may or may not be aware of.<sup>67</sup>

### 3.12 Do many teenagers have night time fears that prevent sleep?

The answer to this question is that we *think* many do. The research about night fears is all on children before they enter high school. A third of all grade 6 children report night fears and most of this group describe them as intense or very intense. It is likely that an even larger number of children below grade 6 level have fears and by grade 6 some, but not all, have managed to overcome them. More girls than boys report fears but we don't know if this is just because of more reluctance among boys to admit them. Some young people try to hide their fears from their parents but the fears may be too disruptive and emotionally charged. The fears may lead to episodes of panic, crying, frightened calling out and insisting on light in the bedroom. They may refuse to sleep on their own. A typical fear episode about an intruder would go like this: The person becomes very vigilant and scans the dark room continuously, their sense of time is changed and they think long periods have passed when only few moments have, things they hear inside and outside the house become distorted through their fear, objects they see in the dark also become changed and they may focus on a dark shadow as a threat and be convinced a looming person may suddenly approach them from that direction.

***Night fears may be too disturbing to keep secret.***

***They tend to be clear, specific fears.***

The fears may start through seeing a scary film or news item or reading a disturbing book. Some are related to adults telling them to be careful of

<sup>67</sup> See Case Study 6.1 in Q6.3 for further details of both conditions.

strangers, burglars, prowlers, kidnappers etc. They are not always about intruders or crime, and fears about frightening insects or spiders (giant or normal sized), war, being buried alive and nuclear destruction can occupy the teenager. Lying in bed in the dark can also lead to major emotional upsets and worries around life events that might happen to them in the future like pregnancy, AIDS, death of a parent or friend or rejection by people important to them.<sup>68</sup> These fears at night can all happen on a regular recurring basis even though the young person knows they are not being rational.

People often worry that ongoing night-time fears may really be a sign of other serious problems. There are three reasons that teenagers may have fears at night. Firstly, it can be something that runs in families. We find that parents of children with night fears often report having had such fears themselves as children. Secondly, the fears may be a sign of stress in the young person's life and this stress needs to be identified and dealt with.<sup>69</sup> In only a very small group of teenagers with night-time fears do major emotional problems like high anxiety states or depression<sup>70</sup> exist that need special help. Some ideas on helping with such fears are discussed in the next chapter.<sup>71</sup>

### 3.13 How can emotional problems affect sleep?

Sleep is very sensitive to how anxious and stressed we feel and it is hard to go to sleep or stay asleep if emotional problems or worries are taking us over. Being depressed also has this effect, and we know that about a quarter of all people with depression<sup>72</sup>

***Problems with emotional control and poor sleep often go together.***

<sup>68</sup> See Q4.1 on learning to control emotions

<sup>69</sup> See Q3.14 and Q3.15 about the effects of stress

<sup>70</sup> See Q3.16 about depression

<sup>71</sup> See Q4.9 for hints and a case study of successful therapy for night fears

<sup>72</sup> See Q3.16 for information on depression and sleep

complain of sleepiness during the day and this is mainly due to poor sleep at night. Emotional problems may lead to poor sleep and then this poor sleep causes mood changes, more irritability and less ability to cope with day to day demands and stresses. High anxiety and worry about getting poor sleep or being an 'insomniac' can just make it all worse.

***Some sleep problems have nothing to do with emotions.***

We know that if we can help a sleep problem, then emotional wellbeing gets better. On the other hand, help with an emotional problem leads to improved sleep, if that was the cause of the poor sleep in the first place. Which of the two issues to target first depends on the person's situation and also on the type of help they are looking for. Is it counselling for some life problems and learning to control emotions?<sup>73</sup> Or is it help with sleep (such as reading this e-book)? A combination of both can work well too. However, if the emotional problems are a result of a sleep problem that no-one knows about, then no amount of treatment for any emotional/mood or depressive problems will provide lasting help. (See Case Study 3.1.)

### Case study 3.1.

Danny was a 15 year old who seemed to feel tired a lot over the last few months. He would go to sleep at night and wake in the morning, usually with a headache, and feeling as if he hadn't really slept. He became moody and irritable, which his parents put down to being an adolescent. He had always been an average to above average student but over the last few months he wasn't doing so well. He had real problems concentrating and often just couldn't be bothered finishing work. He had to really fight to stay awake in the lessons after lunch. He was moody and unpredictable with his friends and he felt that they were leaving him out of their activities. One of his teachers noticed his tiredness and irritability and suggested he see the school counsellor. Then it seemed that suddenly everyone was saying he might be depressed. Danny didn't know what to think – he really just wanted to feel rested and normal again. He had four sessions with the

<sup>73</sup> See Q4.3 for hints on how to deal with emotions

counsellor talking about his problems with his friends and his lack of motivation. Danny liked the counsellor but the sessions didn't seem to make much difference to how he felt. The counsellor knew that ongoing tiredness was often part of depression. But she also knew that tiredness may also be a result of physical things, so a medical check up was suggested. Blood tests were normal but the doctor was thorough and asked quite a lot about his sleep. His mother described how Danny was a noisy breather at night and would probably be like his dad when he grew up and snore a lot. The doctor suggested a visit to a sleep clinic at the hospital and an overnight sleep recording showed that Danny had obstructive sleep apnoea.<sup>74</sup> In other words his sleep was interrupted, perhaps 100 times per night, by not being able to breathe properly. When this happened he moved from a deeper sleep to a light sleep, so his nights were far from restful. His symptoms were not a result of depression but due to ongoing poor sleep. He was given a special mask to wear at night, which kept his airways open, and things quickly improved.

### 3.14 What effect does stress have on your body and on sleep?

The best way to think about stress is in terms of the 'fight or flight' response. Humans evolved so that the body produces a stress response when an external threat (eg a lion) was present. To enable fighting or fleeing,

***A body under stress  
is ready to fight or  
flee.***

heart rate and breathing increases, muscles become tense and stress hormones are released. Blood and the action hormone, adrenalin, flow away from the trunk of the body to the arms and legs, ready for action. Stress problems arise when a person experiences the threat (or threats) as *ongoing* and the body's 'fight or flight' response is continuously active. This causes the symptoms of stress, which can be physical, emotional or behavioural. If a body is continually in a stressed state ready to respond to a lion threat it can't fall asleep. Box 3.4 lists possible symptoms of stress. Obviously no-one will have all the symptoms listed - different people will experience different things in response to stress.

<sup>74</sup> See Q3.10 for information on sleep apnoea



It sometimes happens that adults go to the doctor with various symptoms that they can't account for and after everything has been checked out the only explanation is that it is probably a response to stress. It doesn't mean they are making up the symptoms - the symptoms are real and cause pain or changes in behaviour (like poor sleep) - it's the body's response to thinking it's always under threat. See Case Study 3.2.

**Many people experiencing stress symptoms worry that they may be sick with something serious.**

**Box 3.4 Possible Symptoms of Stress**

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Sleeping poorly	Dry mouth	Distractible
Headaches	Moodiness	Poor motivation
Butterflies in the stomach	Fatigue/weariness	Biting nails
Trembling	Irritable	Knee jiggling
Stiff shoulders	Fearful	Less personal care (eg showering)
Stiff jaw	Feelings of panic	Eating more (especially junk food/sweets)
Aches and pains	Phobias	Eating less
Trouble swallowing	Anger	Overbearing socially (talking too much)
Stomach pains	Tearful	Withdrawing socially
Stomach cramps	Feelings of hopelessness	More smoking or drinking
Constipation	Resentful	Drug use
Diarrhoea	Oversensitive	Sweaty or cold hands
Frequent urination	Indecisive	Racing heartbeat
Faster, shallower breathing	Poor concentration	Nausea
Dizziness	Forgetful	Irrational
Self-critical	Feeling hurried	

---

**Case Study 3.2 :**

Dave was 12 when he started to develop a fear of sleeping in the dark and made sure that his door was left open with the hall light on. He also became scared of spiders and insisted that someone check his bedroom every night before he went to bed. Around the same time he started to complain of stomach pains and cramps. His parents were concerned and took him to doctors and he had many specialised tests. Dave ended up missing lots of school. No-one could work out why he was having the stomach pains and everyone was quite worried. The school year ended and Dave and his parents went on an overseas trip. The stomach pains didn't seem to be much of a problem at that time. Almost by chance one day on his holiday Dave started talking about how much he hated school last year because one of his old friends had started bullying him. Things started to fit together. His fear of the dark and spiders and the stomach pains had been part of the way that Dave responded to the stress of bullying and no-one, including Dave, had any idea that this was so. When they returned home Dave's mum found some herbal tablets to ease his stress, Dave got help with dealing with the bullying and his own feelings and the school did some sensible things to reduce the harmful activities of the bully towards several kids.

### **3.15 How does stress relate to the development of emotional problems for teenagers?**

When a person experiences stress they start to feel anxious. These feelings are usually based around something that they think may happen in the future like a school presentation or concern about the illness of a family member or bullying at school. If the stress increases this anxiety sometimes turns into anger. The anger can be directed specifically at a person or at events that have happened or may happen. If the stress gets worse the person may have a depressive reaction. Their stress initially leads to over-arousal (ready for fight or flight) and this can produce a range of symptoms (see Box 3.4). Too much over-arousal may eventually cause a state of under-arousal to kick in (that is depression).

***Stress can lead to anxiety, anger and/or depression.***

At any one time at least 30% of teenagers experience anxiety that is of concern to them but is not considered severe enough for medical people to become

***Anxiety can be like a disability.***

involved. Once anxiety starts to interfere with everyday life it becomes what is called 'clinically significant'. Up to 10% of young people have clinically significant anxiety that has serious consequences for the quality of their lives. This means there may be several students per class. Teenagers with such problems need to get some help and treatment is available. A doctor or school counsellor is a good person to see about such problems.

People interpret many different things as a threat, or being stressful. What stresses a particular person is partly determined by personality, what else is happening in their life, the level of support from family and friends, their own expectations and ability to deal with problems.

Part of why teenagers get stressed is because there are so many changes and potential areas of conflict during those years. Box 3.5 sets out some reasons why they are especially likely to get stressed.

Importantly, teenagers are more vulnerable than children or adults because the hormonal changes associated with puberty heighten their experience of all the emotions and thus increase how often anxiety, anger and depression are felt. All this often happens before they have had a proper chance to work out good ways to deal with their emotions. Some hints on this are given in the next chapter.<sup>75</sup>

***Teenagers are especially vulnerable to ongoing stress.***

### **3.16 How can depression affect sleep?**

Before thinking about sleep and depression we need to understand what we mean by 'depression'. It may be a passing mood lasting from a few

moments to a few days. In such cases it is usually a response to something that has happened. A friend going away, a pet dying, the weather, the female hormonal cycle, putting on weight, having a difficult teacher, a parent being overly critical, a boyfriend/girlfriend conflict and a bad mark at school are all examples. These events can certainly affect mood and sleep, and emotional responses have been discussed in the previous few questions dealing with stress.

Box 3.5 Why teenagers are more likely to get stressed:

- 
- Lifestyle changes, including sleep
  - Changes in what is seen as important
  - Conflicting messages about what is important
  - Wanting independence but family love and security at the same time
  - Hormonal changes to do with puberty
  - Less experience dealing with emotions, so less strategies available
- 

However, in this section when we use the word 'depression' we will mean 'clinical depression' which includes a

***Clinical depression needs immediate attention.***

whole group of emotional, mental and physical experiences that are severe enough (or milder but around for many months) to be of medical concern. (See Box 3.6 for the main symptoms of clinical depression.)

The rates for clinical depression in young people are 2% to 6% of teenagers at any one time. The rates are less among younger teenagers and more for the older group. More girls are at risk for depression than boys but the difference between the sexes is not major. Depression can be associated with other problems such as high anxiety, drug abuse,

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<sup>75</sup> See Q4.3 on hints about dealing with emotions

alcoholism, eating disorders, manic behaviour<sup>76</sup> or personality disorders. In some cases depression is primarily associated with winter.<sup>77</sup>

The clinical condition of depression is important to cover in an e-book about sleep disorders for two reasons. Firstly, sleep and related disorders can easily be misdiagnosed as depression<sup>78</sup> and secondly, sleeping problems can be common in depression. In fact they are often an early sign of depression.

There are different ways sleep can be affected by depression. In most cases the person with clinical depression will report trouble sleeping. They may or may not fall asleep easily but will wake up during the night and, importantly, early morning awakenings are common. Sleep can be unrefreshing and naps taken frequently. About 25% of people with depression have daytime sleepiness but this is not always a result of problems with their night time sleep. Some depressed people do not really have an increased need for sleep, but more a need to stay in bed as a way of escaping life's problems. Staying in bed means sleep happens in small bits across a 24 hour period and it might be hard to work out what the real sleep need is. Depressed people who have poor sleep are the ones who tend to lose weight when depressed, while those with extra sleepiness tend to put on weight when depressed.

***Sleeping  
problems  
indicate  
depression  
in some  
cases.***

It is likely that teenagers who are depressed do not have as much disruption to their sleep as adults with depression do. This is because depressed adults may have a shift in their body rhythm that means they

<sup>76</sup> see Q2.6 for manic depression and sleep

<sup>77</sup> See Seasonal Affective Disorder in Q5.8

<sup>78</sup> see Case Study 2.1 (within Q2.5) about Chronic Fatigue Syndrome and Case Study 3.1 (within Q3.13) about sleep apnoea

need to go to bed *earlier* and hence wake up earlier (eg 3 or 4am). Yet, elsewhere in this e-book<sup>79</sup> we show that during puberty the body rhythm tends to shift to a *later* timing, with the result that teenagers often want to wake up later in the morning. Perhaps in depressed teenagers the two tendencies act against each other and the sleep disruption is thus sometimes less than in adults.

Studies of depressed people have shown that many have been poor sleepers for months or years. Of course many poor sleepers never go on to be depressed, but could it be that sometimes sleep problems cause depression? Some researchers think so. Thus they say that if a depressed person has poor sleep, fixing the sleep may fix the depression. Others say this is

***Poor sleep and depression may be like the chicken and egg problem (which came first?)***

too simplistic and the link may be through the fact that some people react to life's problems with poor sleep and these people are at a higher risk of also developing depression. Sometimes trouble sleeping and depression can run in families. There may be a cluster of genes that control both depression and poor sleep in some people.

Young people who think they are clinically depressed should definitely seek out some help because treatment is available (see Box 3.6). Trying some suggestions to help control emotions and improve sleep that are discussed in Chapter 4 may provide a starting point but a combination of approaches, including support from others (family and/or professionals) will work best.

### **3.17 Is panic disorder related to sleep?**

Some people experience episodes of panic when they are in bed, either going to sleep or during the night when they wake up. They are not

<sup>79</sup> see Q1.2 about the timing of sleep in teenagers

associated with dreaming. People with panic disorder (without depression) sleep quite normally. It thus makes more sense to treat it in itself<sup>80</sup> as a wake problem and not as a sleep problem.

**Box 3.6: Symptoms of clinical depression**

Young people with clinical depression have some of the following symptoms:<sup>81</sup>

*The symptoms marked # can occur in certain sleep disorders and may not be, in themselves, an indicator of depression.*

- Depressed mood
- Irritability#
- Less energy#
- Poor quality night time sleep#
- Wanting to sleep during the day#
- Trouble concentrating#
- Loss of self confidence
- Frequent tearfulness
- Strong feelings of guilt
- Feelings of hopelessness and despair
- Loss of interest in activities normally seen as interesting
- Trouble coping with life's routines
- Brooding over the future or the past
- Withdrawing from social contact
- Reduced talkativeness
- Decrease or increase in appetite with weight change

In checking for clinical depression specialists would be concerned if a person were experiencing three or more of these symptoms quite strongly for two weeks or more, or if they had three or more symptoms in a milder form for many months.

**3.18 Can poor sleep become a habit?**

Yes, some people start having poor sleep for a reason that they can easily identify. Perhaps it was an illness or worry about some school work or a relationship problem. This can start a period of sleeping badly. Then when the problem is resolved they look forward to sleeping properly again but this doesn't happen. We don't know why this

**Poor sleep can take on a life of its own.**

<sup>80</sup> See internet sites listed at the end of this book about panic disorder

<sup>81</sup> See also the internet sites on depression listed at the end of this book.

occurs but in some people the poor sleep just continues. However, we find that once they do a few self help things over several weeks, as set out in the next chapter, their sleep can get back to normal again.



## ***CHAPTER 4: Trouble getting to sleep or staying asleep –***

### ***What helps?***

#### **4.1 How can the time needed to fall asleep be shortened?**

There are lots of different things that will help. One thing to remember is that it's not just a matter of changing what a person might do once they get into bed (although there are certainly things that will help.) They need to also think about what they do *during the day, during the evening and at bedtime*. The things to do are set out as a checklist. What is really important is that most of these things need to be done for *at least three weeks*. Poor sleepers are great at saying that they have tried 'everything' and 'nothing works'. Just as antibiotics won't kill all the bacteria in just one or two days – don't expect this program to work straight away. Persistence and a positive attitude are everything.

***Good sleep depends more on what happens before bed than in bed.***

Another important point is that many poor sleepers feel they take hours to get to sleep. Yet when they are tested in a sleep clinic almost all are asleep within 20-30 minutes, they are not good at judging how long they are awake for. It's not because of the different setting in the clinic for sleep, as care is taken to have them sleep many nights in the sleep clinic to adjust. It is likely to be because of misperceptions about sleep<sup>82</sup> or because their higher level of anxiety changes the perception of time.

***Anxiety can make time slow down.***

<sup>82</sup> See Q3.2 about the difficulty in knowing whether we are asleep or awake

A poor sleeper doesn't need to do everything set out below for three weeks (e.g. the warm bath may not suit every night) but most are not optional. After three weeks they can start to think about which ones are more important. By then they will have more insight into what helps get off to sleep. Three weeks may sound like a long time, however the time will pass whether they continue to have poor sleep or improving sleep.

### Bedroom

- ✦ Get rid of the clock by your bedside
- ✦ Have a comfortable mattress
- ✦ Don't overheat with heavy bedclothes
- ✦ Reduce noise
- ✦ Ensure there are no disturbances such as pets
- ✦ Feel secure (a night light might be helpful)<sup>83</sup>

### Daytime

- ✦ Have predictable (routine) going to bed and getting up times
- ✦ Don't sleep in long in the mornings (not even on weekends)
- ✦ Have no naps – they take the edge off the sleep pressure you need
- ✦ Set aside a 'worry time' if you tend to take your worries to bed
- ✦ If you don't get much exercise try to get out and walk during the day

### Evening

- ✦ Avoid all caffeine after 4pm<sup>84</sup>
- ✦ Don't have a heavy meal late at night
- ✦ Any alcohol should be in moderate amounts only, preferable with food<sup>85</sup>
- ✦ Don't do major exercise at this time of day
- ✦ Don't do activities that make it hard for you to unwind (eg nothing too exciting or upsetting)
- ✦ Don't fall asleep on the couch, not even for a minute

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<sup>83</sup> see Q6.5 about night time fears

<sup>84</sup> See Q3.3 on the effects of caffeine on sleep

<sup>85</sup> See Q3.4 for the effects of alcohol on sleep

## Bedtime

- Get ready for bed in good time and wait for a wave of sleepiness – we have one about every 90 minutes – learn to recognise yours
- Have a warm milk drink (it contains a substance that may make you drowsy) or camomile tea (takes a few weeks to work best<sup>86</sup>)
- Take vitamin and mineral supplements if necessary. Lack of necessary things in your diet may be making you feel stressed and unable to sleep<sup>87</sup>.
- Enjoy a warm bath (a shower is OK too– but a good warm soak is more relaxing)
- Do relaxing activities you enjoy (eg music, TV, computer games, Gameboy, magazine, or novel – not school-work if it stresses you)
- Think positively about getting into your snug, calm bed

## In bed

- Make sure your feet are not too hot or too cold (a hot water bottle may help)
- Remember your attitude about your sleep is very important – any anxious thoughts or worries need to be gently pushed aside. Control your emotions and any tendency to worry.<sup>88</sup>
- Once in bed your only job is to do a couple of things. Take your time- there is no hurry- the night is yours now.
- The first step is some muscle relaxation that starts at your toes and ends at your head. (See Box 4.1 below for a description of this or Appendix C if you want to make yourself a recording to relax in bed with.) We might think that it's easy to relax but many people need to learn how to do it first, like riding a skateboard, and this takes time.

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<sup>86</sup> See Q4.5 about alternative therapies

<sup>87</sup> See Q4.4 about non prescription tablets

<sup>88</sup> See Q4.3 for hints on controlling emotions

- The second step is to say to yourself a series of 'feel good' statements. These could be things like 'Resting in bed is nice.' 'I feel calm.' Only use words that make you feel good, like - snug, nice, rest, pleasant, good, cosy, comfortable, safe. Avoid any words about stress, worry, anxious, sadness, or fear. These are what we call 'negative' words and have no place whatsoever in bed. If you find some unwelcome thoughts creeping in try to gently push them aside and replace them straight away with a 'positive' sentence.
- It sounds a bit weird but it will help you relax and feel better if you make yourself smile a little as you lie in bed in the dark- no-one will see you. For reasons that we don't understand the physical action of smiling has all sorts of good effects on the mind and makes us feel better.
- If you are not moving into a pleasant sleepy state, repeat the second step. Remember all these tips may take time to work for you and you need to keep doing them for at least three weeks.

#### Box 4.1 Muscle relaxation

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Lie on your back and put your arms by your side. Relax your feet so they fall outwards. Take three slow, deep breaths and notice how the air moves in and out of your lungs. Think about your toes and tense them while counting up to three. Then slowly release the tension from them. Now, working upwards from your toes, tense and release each part of your body in turn. Keep your eyes gently closed. Take one or two slow deep breaths when moving between different body parts.

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## 4.2 What helps overcome awakenings during the night?

Most people do wake up during the night but usually they go back to sleep without having realised that they woke up.<sup>89</sup> If a person feels they are likely to awaken during the night, they should talk to themselves in bed *before* going to sleep and tell themselves that if they do wake up a bit they will keep their eyes closed and go back to sleep straight away without really waking up fully. Once awake, they shouldn't look around the room or find out

***Keep the eyes closed.***

what time it is – it will only increase the worry about sleeping. If they need to go to the bathroom they should try to stay as sleepy as possible.

Sometimes a dream can even be continued once back into bed. Once a sleeper is wide awake they should try doing one or both of the steps described in the last question. Above all, don't worry. We get most of our 'core sleep' in the first part of the night. Some people would argue that what we get in the last few hours is not essential to our wellbeing.

***Don't worry about getting enough sleep.***

## 4.3 How can emotions that stop sleep be dealt with?

Some young people are frequently swamped by emotions that affect the way they deal with life. Because of the way stress works<sup>90</sup> this can lead to lots of symptoms, including stopping sound sleep. Those who want to be more successful in dealing with emotions should do four things.

*Job Number 1:* Sometimes our lives are so hectic that the only time we have left to try to work things through is when we go to bed. This starts a cycle of poor sleep that reduces how well we can cope with the emotions in the first place. It is important that you spend time looking inwards about what is happening BUT don't do this when you about to try to go

***Take time out but not in bed.***

<sup>89</sup> see Q1.15 about how our sleep changes across the night

<sup>90</sup> See Q2.3, Q3.13 and Q3.14 for more information about stress

to sleep. Consciously make another time that is not near bedtime. Perhaps take a walk or a relaxing bike ride to do this or soak away some time in the bath. Listen to some music and collect your thoughts.

*Job Number 2:* Emotions can be very confusing and it's a good idea to work out which types of emotions might be affecting you. Is it worry about something that you feel might happen? Is it guilt about something you did and now wish you hadn't done? Is it envy about what others have that you wish you had? Is it anger about something someone did or said to you?

**Look  
inside  
your  
head.**

Is it resentment about the way things are going in your life that you don't have much control over? Are you feeling that you are not important? Are you sad about something that has happened? People often feel more than one emotion at a time and it's worth trying to work out your own feelings. Some people use a diary to help them think through their feelings or look at situations that have happened and their responses to them. Whether a diary suits you or not, it's good to become a self commentator- exploring with yourself why you are feeling things. Don't get stuck in one groove, look at things in a range of ways and avoid a simplistic explanation. Emotions are rarely simple.

*Job Number 3:* Sometimes your thoughts don't work in your favour and you need to turn them around. If you are a worrier, be realistic about the

**Challenge  
your thinking.**

consequences of future events. Are they likely to be major or minor? Think back to other times when you were worried – did things work out as badly as you had feared? Avoid seeing catastrophes around every corner. Learn from your past experiences and realise that being a pessimist (fearing the worst) can be stressful. If you are angry about things you can't change then rehearse dialogues and imagine confronting the person or thing you are angry with. A few imaginary confrontations can help you get it out of your system but don't do this more than once or

twice. If you are the sort of person that says 'I can't do it' then think of all the things that you have been able to do successfully, even when you weren't sure. Remember things you have done that you have been proud of. If a group of people don't make you feel successful then think of situations with other people where you have felt more successful and tease out the reasons why you felt good in that situation. Guilt, sadness and depressed feelings are a natural reaction to some things that happen in life and the key is to work out what can be changed and what can't be. If you can get to some level of acceptance then it will reduce your stress. In Box 4.2 there are a few sayings that people have found helpful in trying to challenge their thinking.

***Don't  
bottle it  
all up.***

**Box 4.2:** A few sayings to remember (when awake- not when trying to sleep!).

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Take each day and moment as it comes. Don't spend time anticipating things that may or may not happen. This one needs practice, especially to avoid taking worries to bed.

- Don't expect too much from yourself or from others. No-one is perfect.
- Stress can come from expecting things and then being disappointed. Reduce your expectations.
- To have a friend, be a friend. If shyness is a problem try putting yourself in the other person's shoes during encounters.
- Treat others as you would want to be treated. Not doing this only leads to guilt.
- Things are always harder at first. And they usually look harder than they really are.

*Job Number 4:* Everyone needs a way to express thoughts and feelings that trouble them. Expressing them helps solve problems. How you un-bottle your feelings involves working out what is best for you. You may prefer just to 'talk' to a diary or an imaginary counsellor. Writing letters that you don't send can help work through emotions. However, it's usually best to seek out a trusted friend or an adult (parent or someone else). Sometimes it's actually easier to talk to someone you don't know and whose job it is to listen. Phone help lines can be good,<sup>91</sup> or a school counsellor. Boys find it especially hard to tell their troubles to others and may need a lot of courage to do so. If you think going to a trusted friend or adult is the best approach, try to choose a good listener. Avoid someone who only sees things from one angle and likes to give heaps of advice. If necessary tell them you just want someone to listen and don't want advice at this stage.

If you feel anger and resentment towards someone, you need to decide whether talking to them is the best approach. Be clear on your expectations. If you going to talk to a person you are in conflict with try to plan what you want to say beforehand. Ask what you expect from the meeting and try to make your wishes known to the other person. It's best to use 'I' messages like 'I felt really upset when you....' 'I wish that.' Avoid any suggestion that you are blaming them- you want to tell them how you feel and work things out from that point. Sometimes girls find it especially hard to admit that they are angry about something that has happened.

Although we say don't take your troubled feelings to bed, some people think it's good to release some anger by thumping the pillow vigorously, perhaps even shouting at the same time. Best not to do it just before bedtime though.

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<sup>91</sup> Look in the front of the phone book. Kids help lines are usually listed, or an adult help number, like Lifeline, can be contacted for the number of the Kids line.



#### 4.4 Can non-prescription tablets help sleep?

There are several types of over the counter tablets that may help sleep. The first group are the *vitamin and mineral* supplements. We know that a lack of some of these in the diet can cause tension, nervousness, depression, irritability and even trembling and butterflies in the stomach.

These symptoms can all lead to trouble with sleep. Adequate amounts of the B group of vitamins are essential with B5 (pantothenic acid) and B6 being among the most important for sleep. The processing of so many foods we

***Inadequate nutrition  
can make sleep  
problems worse.***

eat eliminates many vitamins. Magnesium is especially involved in the normal functioning of the central nervous system and importantly, drinking alcohol means lots of the body's magnesium intake goes out in the urine. Calcium is involved in nerve tissue relaxation, which helps sleep, and can decrease your sensitivity to pain. Some nutritionists recommend that where lack of sleep may be due to feelings of stress, supplements should be taken half an hour before bedtime with a warm drink. The supplements for adults may include 10mg B6, 100mg B5 (pantothenic acid), 250mg magnesium oxide and 500mg calcium lactate. Talk to a pharmacist or health professional about the best way to ensure adequate vitamin intake.

Other non prescription tablets that may help sleep are the herbal remedies<sup>92</sup> sold in chemists and health food shops. Long term use of these may not be a good idea, both because people are likely to develop tolerance to the effects, so they no longer work as well, and because the health effects of long term use have not been documented. In most herbal preparations to help sleep the main active ingredient is valerian. This herb has been used for thousands of years to help sleep and is even mentioned in the Bible.

***Valerian  
is the  
main  
herb for  
sleep.***

Studies have found that while valerian is useful, a combination of valerian and hops (one ingredient of beer) seems to be the most effective. However, they need to be taken for several weeks before there is significant improvement in sleep. A dose of between 200 and 1000mg is usual for adults and it is taken 30 to 60 minutes before sleep time. It will help get to sleep and relax the muscles. In some people the effects may carry over into the day, making them sleepy.

There are also some products on the market to help calm children and teenagers who are highly strung. Hops are the active ingredient and they can be taken during the day or at night.

#### 4.5 Can other alternative therapies help?

Aromatherapy and the use of bath oils to relax people have become increasingly popular. We know that the smell receptors in your nose lead to the main emotional centre in the brain so the apparent calming effect of some smells may arise from this direct link. However, there is generally no scientific data on their effectiveness. Those considered best for sleep are lavender, meadowsweet and hops, camomile and orange blossom, frankincense, marjoram, sandalwood, rosewood, lemon balm, lemongrass and linden (lime). Melissa oil is said to help depression. Some herbal drinks are recommended for sleep, notably camomile tea, which is said to become more effective with continued use. The active ingredient in camomile tea has been found to bind to a chemical in the brain that is involved in bringing on sleep.

***Natural therapy products may help relaxation.***

Seeing a counsellor or psychologist who has a special interest in sleep can help deal with many issues that are interfering with good sleep. They can help with “sleep hygiene” (that is those issues that relate directly to

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<sup>92</sup> see Q4.5 for information on herbal teas.

promoting good sleep), help reduce stress (so it stops affecting sleep) and some are trained in the techniques of hypnosis. Hypnosis can be an effective therapy for sleep problems, with a range of applications, including helping to get to sleep and dealing with unpleasant interruptions to sleep, like nightmares.<sup>93</sup>

#### 4.6 Why do people suggest counting sheep?

Most people have heard of the advice for poor sleep, counting sheep jumping over a fence one by one until they fall asleep. The idea is to focus on the counting of the sheep - a mindless, rhythmic, repetitive action – and this distracts from thinking about the things that might be stopping sleep. It works for some people but if a person has had quite a bit of trouble dropping

***Turning the mind to slow repetitive actions can help bring on sleep.***

off to sleep it may not help all that much.<sup>94</sup> An alternative, with a similar idea behind it, is to focus the mind strongly on slow, deep breathing – thinking about the air going in and out of the lungs (or see Box 4.1 or Appendix C for muscle relaxation).

#### 4.7 Can sleeping tablets help and are they a good idea?

Some people think that sleeping tablets are the answer for helping poor sleep. This might be so if the perfect sleeping tablet was available.

Unfortunately it's not. Most sleeping tablets are short acting benzodiazepines (drugs in the same family as Valium<sup>TM</sup>) which have their peak action 1-3 hours after taking it. Longer acting sleeping tablets may be prescribed if a person has high anxiety during the day, but these make people more 'dopey'. That is, they reduce the ability to act and think normally during the next day with an

***The perfect sleeping tablet does not exist.***

<sup>93</sup> See Case Study 6.2 in Q6.6 about hypnosis to control a recurring nightmare.

<sup>94</sup> See Q4.1 for a range of hints for falling asleep more quickly

increased possibility of confusion, falls and car accidents. Box 4.3 sets out the advantages and disadvantages of short acting benzodiazepines.

#### Box 4.3 Short-acting benzodiazepines

##### Advantages

- with short term use (less than 4 weeks) can increase total sleep time, help fall asleep more quickly and stop waking up during the night as often
- muscle relaxant effects

##### Disadvantages

- possible side effect of depressed mood
- possible short term memory loss as a side effect
- reduces respiratory drive, can cause sleep apnoea in some people
- major risk of overdose if taken with alcohol
- tolerance develops quickly with temptation to increase dose
- second half of night may be disturbed with rebound insomnia if drug is very short acting
- high dose can induce coma/death
- possibility of dependency
- ineffective after 3-4 weeks of continual use
- withdrawal leads to REM rebound<sup>95</sup> and poor sleep
- withdrawal from high dose or long term use may lead to sweating, psychosis, delirium fits or hypertension

All these sleeping tablets suppress REM sleep during the night, leading to withdrawal effects (see Box 4.4). Doctors are often reluctant to prescribe these to young people<sup>96</sup> and if they do they will aim for the lowest dose possible for only a short period of time.

Studies where people took either placebo (dummy) tablets or active sleeping tablets (not knowing which were which) show that the placebos themselves can help sleep due to what is called an 'expectancy' effect.

<sup>95</sup> See Box 4.4

<sup>96</sup> See Q4.11 for what to expect from a visit to a doctor about poor sleep

Importantly though, when placebos are taken *after* a period of taking sleeping tablets we see withdrawal effects from the tablets and much poorer sleep is reported. This is summarised in Box 4.5.

#### Box 4.4 What is REM rebound?

REM rebound happens when the amount of REM sleep during the night is reduced, resulting in less dreaming. Many different substances will reduce REM sleep during the night. This builds up a lot of pressure for REM sleep. As soon the substance that reduces the REM sleep is no longer taken, the sleeper experiences a lot of REM, called a REM rebound. The intensity of this depends on how long the substance has been taken for and how high the dose was. The sleeper normally experiences vivid dreams, frequent awakenings, less refreshing sleep and sometimes nightmares. This may affect sleep for more than a week after stopping the substance intake.

**Box 4.5:** The sequence of a study where people took no tablets, sleeping tablets and placebo tablets and their different effects on sleep.

- Weeks 1-2:
  - Usual poor sleep (no tablets)
  - Trouble getting to sleep, wake up frequently
- Weeks 3-4:
  - Taking placebo tablets (think they are sleeping tablets)
  - Better at getting to sleep, waking up a bit (expectancy effect reduces anxiety about sleep)
- Weeks 5-7:
  - Taking sleeping tablets
  - Sleep wonderfully
- Weeks 8-9:
  - Taking placebo tablets again (think they are sleeping tablets)
  - Can get to sleep fine but wake up many times during the night, having vivid dreams, and in the morning feel exhausted (withdrawal effects).<sup>97</sup>

<sup>97</sup> See Box 4.4 above on REM rebound

A significant number of older or elderly people have been taking sleeping tablets regularly for years.

Yet we know that they don't work after about four weeks.

People keep taking them because they think that they can help. It may be because taking the tablet reduces their anxiety about sleeping or, more likely, because when they have stopped for a night or two the withdrawal

effects have convinced them that their body needs the tablets in order to sleep.

***Sleeping tablets are ineffective after a few weeks.***

In recent years a new class of sleeping tablets has emerged and their availability varies a lot between countries. They are called Zaleplon, Zolpidem and Zopiclon (the latter is marketed as Imovane™ or Zimovane™). They are said to be as effective as the short acting benzodiazepines in helping sleep with less withdrawal effects, no REM rebound and less interaction with alcohol. However, they have the possible side effects of a bitter aftertaste, dry mouth and initial daytime drowsiness. There may be a need to increase dosage over time (tolerance effect). The possibility of becoming dependent if they are used regularly is not yet clear. They seem to work quite well for some people with intermittent use (eg 2-3 times per week).

***A newer group of sleeping tablets may be better.***

It has been found that among high school students, those with irregular sleep times use sleeping tablets more frequently than students with more predictable sleeping times. We also know that in many cases teenagers seek sleeping tablets for problems that are actually depression.

## 4.8 How are sleep apnoea and snoring treated?

Sleep apnoea always needs treatment while treatment for snoring is normally considered optional.<sup>98</sup> Snoring mainly disturbs others, not the sleeper. If the person with a snoring problem or sleep apnoea is overweight then the first treatment is weight loss. This is because the first place that we deposit extra fat is at the back of the throat (reducing the airflow). Fortunately when we take off weight it comes off here first as well. If drinking alcohol is a regular activity then reducing this will help. The sedating effect of alcohol relaxes the muscles of the neck and can stop airflow. Sleeping tablets should not be taken for similar reasons. Stopping smoking will only be of benefit if weight is not put on as a result. As being deprived of sleep reduces our drive to breathe it is important that a person with sleep apnoea regularly gets enough sleep. Sleeping on your side rather than on your back will reduce breathing problems during sleep and some people wedge a pillow under their shoulders so they don't move onto their back.

***Lifestyle changes can help.***

A sleep clinic will determine how severe the sleep apnoea is through an overnight sleep study.<sup>99</sup> Which type of treatment is recommended will depend on the severity of the sleep apnoea and specifics of the case. Some of these treatments have also been successfully used on people who want to treat their snoring problem and have not had any success with the lifestyle change suggestions in the last paragraph. Specialist dentists can make special devices to be worn in the mouth at night to help keep the airway open. In some cases surgery is recommended. Removal of the tonsils and adenoids can be effective in children if they are larger than they should be. Many people with sleep apnoea sleep every night with a face mask connected to a small pump that increases the pressure of the air they breathe, thereby keeping the airways open.

<sup>98</sup> See Q3.9 and Q3.10 for causes and the consequences of snoring and sleep apnoea

<sup>99</sup> See Q2.7 for information on sleep medicine and sleep clinics

## 4.9 What might help night time fears?

Night time fears are often a problem for young people<sup>100</sup> and the best first approach to preventing them is to see if some reassurance can easily be provided. A small low wattage night light may be a good first option. In some cases the person may be able to sleep with a brother or sister for a while, or have the option to sleep in their parent's room on the floor if this suits the parents. The problem is that this arrangement might be hard to stop. An intercom between bedrooms can provide a lot of comfort - they know it's there if they need to contact someone. Alternatively, a personal security alarm can be placed by the bed, or held by the nervous sleeper. A baby monitor to the parent's room has even been successfully used. Using some self help strategies as outlined in Case Study 4.1 can help control fears. Hypnosis may be useful in severe cases that don't seem to have an underlying cause. Stress and emotional problems can cause night time fears and even phobias about frightening things like spiders.<sup>101</sup> Where such problems seem to be important then strategies to control emotions should be investigated,<sup>102</sup> including the possible help of a counsellor.

**Reassurance  
and self-help  
tips can  
reduce night  
time fears.**

### Case Study 4.1:

The parents took their 13 year old daughter, Romana, to see the counsellor. She was scared to go to bed and had come to associate the dark with a strong fear of a burglar walking into her room. The fears had started a few months ago and she didn't want to stay overnight with her friends because she didn't know if she could cope. Most nights she would move her blankets and go and sleep on the soft rug in her parents' room. She didn't feel that she was having any particular problems at school- nothing more than the usual. Her mother commented that she herself had had a similar fear when she was a child in Italy and was sleeping in a porch-like part of the house, quite

<sup>100</sup> See Q3.12 about the possible causes of night time fears

<sup>101</sup> see Case Study 3.2 within Q3.14

<sup>102</sup> see Q4.3 for hints on controlling emotions



a long way away from the rest of the family. Fortunately her mother's brother was a whiz with electronics and had put in a simple intercom between her 'porch' bedroom and her parent's room. Romana's counsellor listened very carefully to her problems and made several suggestions. The first was for Romana to get a small hand held personal alarm that she could take to bed. Thus if an intruder came to her bedside, she could pull out the pin and a loud piercing siren would sound throughout the house. Then she suggested that Romana move her makeshift bed on the floor of her parent's bedroom slowly out of their room, down the corridor and into her room. This could take several weeks but it was important that she not move the bed back towards her parent's room. It was important for her parent's to be very encouraging and positive about this move but also to be firm. Another suggestion involved muscle relaxation (see Appendix C) as well as a series of sentences for her to repeat to herself emphasising self control. The sentences were 'I am confident, I am brave' 'I can look after myself when I am alone.' 'I can look after myself when I am in the dark.' She and her mother practiced these things during the evening for the first week or so and then Romana did them on her own before falling asleep during the four weeks before they saw the counsellor again. At this meeting Romana could report that she had moved her bed into her room and almost completely mastered her fear. She was initially nervous about someone lurking under her bed before she got into bed, so this was checked by a parent before bedtime every night. She was proud that she had just arranged to stay at a friend's house that weekend. She felt she now knew what to do when the old fear started to come back. She had become confident that she could handle a fear that she knew had never really made sense.

#### 4.10 How can body rhythm problems be overcome?

There may be a need to change the timing of sleep because it has become 'delayed' and sleep can only come a lot later than it needs to be, given the getting up time.<sup>103</sup> For example, a teenager may only sleep best between 3 am and 11 am. If this is the case and they want to be able to get going earlier in the morning, then they need to follow a program of chronotherapy (*chrono* is to do with the clock) - see Box 4.6. Some people succeed in doing this program themselves or with the help of parents or friends but it requires a lot of motivation and persistence. Keeping a sleep diary<sup>104</sup> can indicate the number of hours sleep may be

<sup>103</sup> see Q1.2 and Q1.3 for details on how the timing of sleep may change in teenagers

<sup>104</sup> See Box 3.1 and 3.2 in Q3.8 for examples of completed sleep diaries and Appendix D for a blank diary

delayed. If sleep timing has been delayed by more than three hours for a long time then the help of a sleep clinic may be needed to fix the problem. If emotional problems are also being experienced then these should also get some assistance. Some people have the timing of their sleep wrong because they are trying to avoid something. It could be school or facing unemployment. An unemployed person can find it more comfortable and less threatening to spend their nights awake and their days, when others are working, asleep. In such cases, obtaining a job may be the only motivator to change the timing of sleep.

#### **4.11 What should be expected from a doctor's visit about inability to sleep?**

Quite a lot of people go to their doctor with sleep problems. It is usual for the doctor to ask some questions to work out whether their problem is getting to sleep or staying asleep or both. They may ask about feelings of anxiety and stress. If the patient is having some emotional problems the doctor is likely to ask about feelings of depression. They need to work out if there is an underlying problem of depression<sup>105</sup> that needs to be treated. Questions will include finding out whether it is a short term problem triggered by something happening in their life or something that has gone on for ages. Many doctors will not rush into giving sleeping tablets to a young person because they can cause problems.<sup>106</sup> They may ask about what sorts of things the person has already tried to help the problem. How long they have tried them for will be an important factor - nothing works quickly. It is very unlikely that the doctor would refer someone to a sleep clinic for problems sleeping unless they felt it might be due to something like sleep apnoea<sup>107</sup> or periodic limb movements.<sup>108</sup>

***Doctors  
should try to  
understand  
the cause of  
poor sleep.***

<sup>105</sup> See Q3.16 about depression and sleep

<sup>106</sup> See Q4.7 for a discussion about sleeping tablets

<sup>107</sup> See Q3.10 for information on sleep apnoea

<sup>108</sup> see Q3.11 about periodic limb movements in sleep

**Box 4.6:** A program of chronotherapy

The basic principle of chronotherapy is to progressively change the sleep timing to be at a new desired time. There are a number of steps you need to do. It will require lots of motivation.

- The first thing is to find out the times when you normally sleep (which are likely to be different to the times you are in bed). You may want to keep a sleep diary (See Appendix D).
- Then think about the new sleep times that you are aiming for, such as 11pm to 7am.
- At first try to keep to a bedtime that feels right for you. Choose a time when you are likely to fall asleep. Don't vary this time much at this stage.
- Your usual waking up time will be later than what you are aiming for. What you need to do is get up 15 minutes earlier than you have been. If you can move it to be 15 minutes earlier every day or two you will make good progress. If you usually sleep in until 11am you can make it 10.45am, then 10.30 am and so on. Don't worry if you need to take more than one day at your new getting up time. What is important is that your getting up time is never getting later. Because you are getting up earlier you will be getting less sleep than you used to, so your pressure to sleep at night will be stronger, and this will help move your bedtimes to be earlier.
- It is very important that when you get up you spend time where your eyes can receive lots of outdoor light. Sitting by a sunny window, even in winter, will be good. Getting good natural light in the morning will reduce the levels of the hormone melatonin in your body in the morning and the rhythm of this hormone drives your body clock. To reset your body clock you must reset your melatonin rhythm and morning bright light will do this. In addition, the more outdoor light you get during the day, the better.
- Gradually start to bring your bedtime to be a bit earlier. Move it 15 minutes earlier every few nights. Be guided by whether you are able to fall asleep without being in bed for too long. If you are spending ages in bed before falling asleep then go to bed later BUT keep your getting up time the same.

- Your body will have a strong drive to go back to your usual delayed sleep pattern and the only way to fix it involves not sleeping in the morning - unfortunately this also applies to weekends and holidays. Once you have fixed your new pattern you must avoid making major changes to your sleep time. If you have a late night it's better to get up around your usual time and then have a short afternoon nap - as long as you can still get to sleep at the right bedtime that night.
  
- Become familiar with the things you can do to help you go to sleep straight away when you go to bed<sup>109</sup>



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<sup>109</sup> See Q4.1 about falling asleep more quickly

## ***CHAPTER 5: Sleeping too much and daytime sleepiness***

### **5.1 How can you tell how tired or sleepy a person is?**

Tiredness is best understood as the same physical phenomena as sleepiness, just of a lesser degree. People describe themselves as tired when they have a slightly increased need for sleep, often from poor sleep or not enough hours of sleep. However, they may not recognise that it's sleep they lack and put it down to working too hard. Sleepiness is more severe and includes a wish to go to bed to sleep. Sleepy people yawn, stretch and rub their eyes, which may feel heavy. They will feel a general slowness, have trouble concentrating and sticking to a task. Droopy eyes come with increased sleepiness and the sleepy person may be irritable, moody and grumpy. They won't be able to stay awake in a comfortable situation, such as watching TV in a warm, dimly lit room or being a passenger in car (rocking the baby syndrome). Their blinking may be slower than usual with some bursts of high blinking activity as they try to focus. With severe sleepiness the person will not be able to stay awake even when doing something active like eating or talking. Some young people spend periods across most days being quite sleepy, which is not good for the people around them who may have to put up with their moodiness, or for their school or job performance. Sleep researchers often ask people to rate their sleepiness at different times of the day or under different conditions on a scale from 1 to 7. The questionnaire in Box 5.1 will give an indication of sleepiness. The early afternoon is a critical period for feeling sleepy<sup>110</sup> if a person is even a little sleep deprived. Thus a score of more than 3 or 4 in the early afternoon generally means that the person should try to get more good quality sleep.

***Some teenagers are often quite sleepy.***

<sup>110</sup> See Q1.20 about afternoon sleepiness

**Box 5.1** Stanford Sleepiness Scale<sup>111</sup>

Which of the following best describes how you are currently feeling?

1. Feeling active and vital; alert; wide awake
2. Functioning at a high level; but not at peak; able to concentrate
3. Relaxed; awake; not at full alertness; responsive
4. A little foggy, not at peak; let down
5. Fogginess, beginning to lose interest in remaining awake; slowed down
6. Sleepiness; prefer to be lying down; fighting sleep; woozy
7. Almost in reverie, sleep onset soon; lost struggle to remain awake

**5.2 When is a tendency to fall asleep anywhere abnormal?**

Most of us have seen people sleeping in unusual places but our society is not very tolerant of people who fall asleep publicly. Some places are considered basically okay, such as on a train or bus, the lawn of a park or even in a darkened lecture theatre (unless you are giving the lecture). Some people can quickly fall asleep anywhere anytime. We only tend to think of someone having abnormal sleepiness that is a problem if they fall asleep while trying to stay awake or are almost always sleepy. In Box 5.2 there is questionnaire that can help determine if the overall level of sleepiness should be considered to be a problem. This scale is widely used in sleep clinics.

***Falling asleep  
in public can  
be very  
embarrassing.***

<sup>111</sup> From Hoddes, Zarcone, Smythe, Phillips, and Dement (1973)

**Box 5.2: Epworth Sleepiness Scale<sup>112</sup>**

How likely are you to doze off or fall asleep in the following situations, in contrast to just feeling tired? This refers to your usual way of life in recent times. Even if you have not done some of these things recently try to work out how they would have affected you.

Use the following scale to choose the *most appropriate number* for each situation:

- 0 = would *never* doze
- 1 = *slight* chance of dozing
- 2 = *moderate* chance of dozing
- 3 = *high* chance of dozing

Situation	Chance of dozing
Sitting and reading	_____
Watching TV	_____
Sitting, inactive in a public place (eg a theatre or a meeting)	_____
As a passenger in a car for an hour without a break	_____
Lying down to rest in the afternoon when circumstances permit	_____
Sitting and talking to someone	_____
Sitting quietly after a lunch without alcohol	_____
In a car, while stopped for a few minutes in the traffic	_____

**Add up the eight scores and find your total.**

Research has found that the following groups score within certain ranges:

Normal sleepers and snorers	0-11
Sleep apnoea	4-23
Narcolepsy (and similar neurological conditions of sleepiness)	12-24
Insomnia	0-6
Periodic Limb Movement in Sleep Disorder	2-16

**5.3 What can cause ongoing sleepiness?**

Ongoing sleepiness is usually caused by insufficient sleep, disturbed sleep or the wrong timing of sleep and these are all covered in Chapters 3 and 4. The most common reason for sleepiness during the day in

<sup>112</sup> From Johns (1991).

teenagers is a result of the patterns of sleep they keep and the things they take that interfere with their sleep<sup>113</sup> (see Case Study 5.1 below).

Sometimes people don't know that their sleep is being disturbed by behaviours such as breathing problems<sup>114</sup> or limb jerks<sup>115</sup> but feeling like they haven't slept in the morning can be a clue. Tiredness or fatigue may be a result of medical conditions like anaemia, hypothyroidism or other medical disorders that can usually be detected with a blood test. Some physical illnesses can make people feel as tired as if they had a sleep disorder.<sup>116</sup>

**Lifestyle patterns are the usual cause of sleepiness.**

Then there are a group of conditions that result in multiple sleep episodes across the day. These conditions may be related to a problem in the central nervous system, such as narcolepsy<sup>117</sup> Emotional problems, particularly depression, can change sleeping patterns.<sup>118</sup> In some cases sleep need and sleepiness may only increase every now and then and conditions causing this are discussed elsewhere.<sup>119</sup>

**Case Study 5.1:**

Mark was 21 years old and a third year student at the University. As he was doing a science course he had lots of hours when he had to be at the Uni and doing lab classes. On most days he had to be there at 9am and because it took a while to go by bus, he had to get up at 7.30 am during the week. He had a fair bit of homework on most nights and weekends. He liked to keep in contact with his old high school friends and spent quite a bit of time socialising with them. On two or three nights during the week they would meet and listen to music, smoking, drinking coffee, or, if they had the money, having some beers or spirits. Weekends they could always find a party or make one.

Mark took a long time to get going in the mornings and seemed most with it during the evening.

<sup>113</sup> See Q3.3 to Q3.6 about caffeine, tobacco, drugs and sleep timing

<sup>114</sup> see Q3.10 about sleep apnoea

<sup>115</sup> see Q3.11 about periodic limb movements in sleep

<sup>116</sup> See Q2.5 about Chronic Fatigue Disorder

<sup>117</sup> See Q5.10 about narcolepsy

<sup>118</sup> See Q3.16 about depression

<sup>119</sup> See Q5.9 about periodic sleepiness



Even then though, he would often find it hard to concentrate and could easily become moody. It sometimes occurred to him that maybe he was lacking something in his diet as he seemed very lethargic all the time. He had forgotten what it felt like to be energetic and alert.

His younger sister was doing psychology at school and one day asked him to keep a sleep diary for a week showing when he went to bed and got up. He agreed to do it to help her out. To his surprise when he looked at the completed diary he was averaging about 6 hours of sleep during the night on weekdays. On Saturday and Sunday mornings when he could sleep in a bit, he got about eight and half hours of sleep before he dragged himself out of bed to start thinking about his assignments. Assuming that he needed an average of eight hours sleep a night, his sister calculated that he was collecting a sleep debt of nine hours every week. Not only was a lack of sleep adding up during the weekdays, he was not fully catching up on weekends and his lost sleep kept accumulating.

The other major thing adding to his lack of alertness was that often his sleep was not good quality sleep. The smoking, coffee and alcohol in the evenings were all making his sleep more broken and less refreshing. Mark decided that for the sake of his own feeling of well being he needed to put some limits on his late night activities and cut down a bit on the things that weren't helping his sleep.

#### **5.4 Why are some people very groggy in the morning?**

Some people are very groggy in the morning, even without having any alcohol, and take quite a while to get themselves together. The disorientation and confusion is because they have awoken from a deep or very sound sleep. It usually is over within 20 minutes but can last up to almost an hour for some people. If someone is regularly getting enough good sleep they will not feel confused when they wake up in the morning. The body will be getting all the deep sleep it needs earlier in the night. If this is not the case, then chances are that they are living with a lack of

***Insufficient  
sleep leads to  
morning deep  
sleep which  
leads to morning  
grogginess.***

sleep. The body will squeeze some more deep sleep into some morning cycles to catch up. This sleep need may be because of lifestyle, trouble sleeping soundly earlier in the night<sup>120</sup> or it may be because there is a sleep problem that is unknowingly disturbing sleep. Delayed sleep phase syndrome,<sup>121</sup> sleep apnoea<sup>122</sup> and periodic limb movements<sup>123</sup> would be the most common sleep disorders causing this. This grogginess can also happen when waking from a nap.<sup>124</sup> We usually see its more extreme form, sleep drunkenness<sup>125</sup> when awakening from a deep sleep early in the night.

### 5.5 Can puberty affect sleepiness?

For reasons we don't understand the tendency to fall asleep during the day does increase with puberty. Perhaps the many physical changes that happen at this time interact with the ability to fall asleep quickly. If a young person has a sleep disorder the high level of daytime alertness that is part of being a child (before the onset of puberty) can mask the sleep disorder a bit and increase the likelihood of it remaining undiagnosed. Once puberty sets in the increased sleep tendency can mean the sleep disorder causing sleepiness becomes more of a problem.

<p><b><i>Hormone changes do change sleep.</i></b></p>
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Puberty also delays the daily time of the secretion of the hormone that helps us go to sleep every night, melatonin, and this can lead to body rhythm problems.

<sup>120</sup> See Q4.1 about falling asleep quickly

<sup>121</sup> See Q3.8 about delayed sleep phase syndrome

<sup>122</sup> See Q3.10 about sleep apnoea

<sup>123</sup> See Q3.11 about periodic limb movements in sleep

<sup>124</sup> See Q5.15 about napping

<sup>125</sup> See Q6.4 about sleep drunkenness

In girls sleep patterns may change across the monthly menstrual cycles. There is some evidence that for some girls poor sleep is more likely in the days *before* their period and more sleepiness *during* their period.<sup>126</sup>

## 5.6 What is a microsleep?

A microsleep is, as the word suggests, a small period of sleep, perhaps 1 to 10 seconds long. During a microsleep the person has a fixed gaze, blank expression on their face and no blinking. They won't remember going into the microsleep but may be aware of a lapse in concentration when they wake up. Microsleeps are rapid changes between being asleep and being awake that the person, and possibly also a companion, may not be aware of.

We know that people who have gone without sleep (and shift workers with disturbed body rhythms), may have microsleeps many times when they are feeling sleepy but trying to stay awake. It is known to be a major problem for shiftworkers, including truck drivers and train drivers, with changing shifts that lead to sleep loss. The consequences of this can be seen in the number of major disasters that have been linked to human error during the early morning 'dead zone' from 3 to 5 am. Such disasters include the nuclear disasters of Three Mile Island and Chernobyl, the Bhopal gas leak disaster in India and the Exxon Valdez tanker oil spill. More than 13% of all car accident deaths and injuries are due to fatigue, with microsleeps involved in many lapses while driving.<sup>127</sup>

***Microsleeps  
can lead to  
accidents  
and even  
disasters.***

<sup>126</sup> See Q5.9 about periodic sleepiness

<sup>127</sup> see Q1.8 about the consequences of driving while sleepy

## 5.7 Are behaviours on remote control related to sleep?

We all do many things every day without really thinking about them, but sometimes doing things automatically and “going blank for a while” can result in silly or inappropriate behaviour. Putting odd things in the fridge is a classic example. Such behaviour has been called automatic behaviour and may occur when a person is not thinking about what they are doing or what is happening immediately around them. In some countries train drivers on night shift have to regularly pull

***People tend to have “automatic behaviour” when they are getting insufficient sleep.***

a “dead man’s handle” to show they are still awake. We know that drivers can do this “on remote control”, while they are so sleepy that they miss important signal lights. It can last from minutes to hours. In some cases it can involve microsleeps (see previous question) and in other cases just a decreased awareness of what is happening around you. It is usually one of the many consequences of not getting enough good quality sleep,<sup>128</sup> although people with a disorder of excessive sleepiness such as narcolepsy<sup>129</sup> often also experience it.

## 5.8 Can a sleep problem relate to it being winter?

Yes, in some countries, especially those closer to the two poles of the Earth, a small section of the population have sleep and mood patterns that change quite a lot with the seasons. This is called seasonal affective disorder and is related to the reduced hours of daylight in winter in some countries. Starting in autumn/fall, and continuing through the winter months,

***Shorter days and longer nights can cause mood and sleep changes.***

the person experiences depression, fatigue, a desire to sleep much longer than usual and an increase in appetite, especially for sweet things.

<sup>128</sup> For other consequences of sleep deprivation see Q1.5 to Q1.7

<sup>129</sup> See Q5.10 about narcolepsy

Weight gain is usual. They may go to bed late and sleep in. This sleep disorder affects younger adults (20-40 years of age) more often than other ages and is four times more likely to be a problem for females than males. Success has been found with therapy that involves getting more bright light, especially in the morning. The high level of light affects the action of the hormone, melatonin, which has been affected by the short winter days. People who get the milder form of this 'winter blues' may benefit their mood and sleep patterns by getting more outdoor light, especially in the morning

<p><b><i>Morning outdoor light can help.</i></b></p>
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## **5.9 What if increased sleepiness only happens every now and then?**

There are a few possibilities here. In girls, the most likely problem may be sleepiness around the time of their period. The problem happens more in teenage girls than women. Some girls have a long night sleep at this time and often take daytime naps if they can. Sometimes their appetite also increases. If the problem is significant, a doctor should be consulted. Sometimes the sleepiness may be a result of periodic limb movement disorder<sup>130</sup> that can get worse just before a period.

If the need for sleep is very great, up to say 20 hours per day, and there is no other, more common reason for this (such as depression<sup>131</sup> or Chronic Fatigue Syndrome<sup>132</sup>) then the possibility of a very rare sleep disorder that starts during adolescence may need to be considered. In the Kleine-Levin syndrome the person will have episodes that typically last for less than a week (but could be for up to three weeks) and these may occur from 2 to 12 times per year. In about half the cases this disorder starts after a virus that may be associated with high fevers. Sometimes a head injury will set

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<sup>130</sup> See Q3.11 about periodic limb movements in sleep

<sup>131</sup> See Q3.16 about depression

<sup>132</sup> See Q2.5 about Chronic Fatigue Syndrome

it off and in other cases there is no obvious cause. It is seen three times more often in boys than girls.

The 'episodes' affect sleep behaviour, eating behaviour and in some cases also lead to uninhibited sexual or aggressive behaviour. The person may suddenly start to sleep for most of the day and be difficult to awake. When they are awake they may be confused, depressed or agitated. They will compulsively eat when they are not asleep and have no feelings of having had enough food. About a quarter of people with this disorder may behave inappropriately sexually, such as making advances in an unsuitable way or repeatedly masturbating. Fortunately the disorder responds to treatment with medications.

***Periodic episodes of severe sleepiness need medical attention.***

### **5.10 What is narcolepsy?**

Narcolepsy means "falling asleep" (Greek derivation). A person with narcolepsy will experience lots of *daytime sleepiness*, possibly with sleep occurring against their will (called sleep attacks). This will usually happen even though they feel they are getting enough sleep at night. The sleepiness will be worse at some times of the day (afternoons) than others and will be hard to control unless they have a nap. The person will want to go to sleep, rather than just feel tired or weary without a strong need for sleep. They will achieve a score of at least 12, and usually over 16 on the Epworth Sleepiness Scale.<sup>133</sup>

In observing a lecture theatre with some students asleep in it, we wouldn't suspect narcolepsy in those students. A teenager falling asleep during a lecture is not that unusual, especially if it's boring and the room is warm and/or dark. However, if the lecturer/teacher in front of the class was having trouble staying awake we could become concerned. People with

narcolepsy may often be very sleepy doing things like talking on the phone, writing a letter or eating a meal.

Narcolepsy usually starts during adolescence and occurs equally in males and females. In a third of all people with narcolepsy some symptoms started before they were 15 years of age. For most the sleepiness started either during their years of being a teenager or young adult. It can be hard to diagnose when sleepiness is the only symptom because there are lots of reasons why people are sleepy and narcolepsy does not yet have a very high profile with doctors and the community. (See Case Study 5.1.)

***Narcolepsy symptoms often begin during teenage years.***

#### Case Study 5.1:

When Marcus was 14 he had a bad virus. He felt dreadful and was in bed for two weeks. They couldn't say exactly what it was but the doctor thought it was a type of flu. After the virus, when he was back at school, he often felt very tired and sleepy. Everyone thought the sleepiness was due to the after effects of the virus. Marcus would drag himself home from school and just have to have a one or two hour nap. He was too tired to ride his bike around with his mates, like he used to do. He usually felt a bit better after a nap but it didn't last long. He knew he wasn't doing as well at school as before the virus but he just always felt too tired and sleepy. The problem was that the sleepiness didn't go away, although everyone expected it to. His GP didn't seem to know what might be causing his sleepiness and just suggested regular bed times. He felt like he was already spending too much time in bed. About a year after the virus he even fell asleep halfway through a two hour exam. His dad took him to the doctor again after that but a blood test showed up nothing. They waited another few months but things seemed to be getting worse- not better. He spent so much of his holidays sleeping he didn't really have much time for his friends and started to feel lonely but he couldn't do anything about it. A few weeks into the new school year his parents were talking to his teacher and she commented on how sleepy he often seemed. So his dad suggested he write down every day when he was sleeping or napping and also when he felt he was struggling to stay awake. It was hard to do because when you're tired you don't want to do anything extra and sometimes it's hard to remember how you felt. Eventually they had a journal covering most

<sup>133</sup> See Box 5.2 in Q5.2 for the Epworth Sleepiness Scale

days over a two week period. They went back to the GP with the journal and the GP said he hadn't realised the extent of Marcus's sleepiness problem. He referred him to the main city hospital where they had a sleep clinic. After recording his sleep<sup>134</sup> for a night and a day in the clinic the verdict was that he "probably" had narcolepsy. They might be more certain as he got a bit older. He got lots of suggestions about things to help control his sleepiness, including a trial of some "wake up" tablets, which made a big difference but had some side effects he didn't like, like mood swings. He surfed the internet and found some sites with good information and was even able to chat with some other young people with narcolepsy.<sup>135</sup>

As narcolepsy develops with time other symptoms usually (but not always) start to appear which are much more specific to narcolepsy than just sleepiness. The major other symptom is *cataplexy* which is a sudden loss of muscle power usually in both hands, arms, knees, legs or jaw muscles in the face. The muscles seem to suddenly turn to jelly and this can lead to dropping something or falling down. Cataplexy is usually triggered by laughter, surprise, anger or sadness. It may last just a few seconds or a few minutes. During a cataplexy attack the person is completely aware of what is happening around them but has lost control over some key muscles. (See Case Study 5.2.) Other symptoms that may develop in narcolepsy include *sleep paralysis*<sup>136</sup> (which often also occurs in people without narcolepsy). This paralysis of the muscles happens during transitions between sleep and wake. *Hallucinations*<sup>137</sup> during these transitions or while fully awake may also occur with narcolepsy. Sometimes the person with narcolepsy will report especially *vivid dreams or nightmares*<sup>138</sup> and their night sleep may have lots of periods of waking up. People with narcolepsy will fall asleep very quickly during a nap or at night. There is a condition very similar to narcolepsy, but where the only symptom is

***Cataplexy seems like nothing to do with a sleep disorder.***

<sup>134</sup> See Q5.12

<sup>135</sup> See Internet site suggestions at the end of this book

<sup>136</sup> See Q6.8 about sleep paralysis

<sup>137</sup> See Q6.7 about hallucinations

<sup>138</sup> see Q6.6 about nightmares



sleepiness, called idiopathic hypersomnia. In teenagers it is very difficult to distinguish the two as in narcolepsy sleepiness may be the only symptom for years.

#### Case study 5.2:

Anna was 17 when one day she suddenly collapsed onto the floor when her school friend told her a joke that she thought was hilarious. She was on the floor for about a minute, completely unable to move. She could hear her friend start to panic, thinking she had had a fit of some sort. From one moment to the next she snapped out of it and was able to stand up and felt fine. Neither of them had ever seen anything like it but because she seemed fine they shrugged it off. The next time it happened Anna was playing netball and the match was very close. Unexpectedly she got the ball and was able to put it through the hoop- giving their team a narrow lead. She felt terrific. Suddenly she was down on the floor, just like before, unable to move a muscle. The game stopped and they all crowded around her. Anna couldn't speak to reassure them. After a few minutes she was back to normal but the captain and coach insisted that she sit out the rest of the game on the bench. The third time it happened was at home when her younger brother sneaked up on her and gave her the shock of her life. Down she went, just like the other times. Her mother was there and became extremely worried; especially when Anna told her this was the third time in about three weeks. Her mother insisted they go to the doctor. The doctor sent them to a neurological specialist to check out the possibility of epilepsy. There was no sign of epilepsy but the doctor asked Anna lots of questions about her sleeping patterns. Anna said that she had developed a reputation for being a "sleepy head" and was able to fall asleep in all sorts of unusual situations. She remembered napping a few times in the changing cubicles when trying on clothes in shops. The short naps recharged her and stopped her feeling so sleepy. Her mother commented on how often Anna had started having naps during the day- especially on weekends. The neurologist thought it was possible that the collapses that Anna was experiencing might be cataplexy and explained that this was one symptom of a sleep disorder called narcolepsy. He gave them some literature about narcolepsy and suggested some tests in a sleep clinic. The narcolepsy- cataplexy diagnosis was confirmed in the sleep clinic but Anna decided to try to cope without any tablets for the time being. She learnt to recognise the situations when a cataplexy attack was most likely and flatten her emotions a bit. This sometimes helped, although her friends learnt to try to "test" her and would tell her funny jokes to try to bring on an episode. The sleepiness was helped a bit with some regular naps during the day.

### 5.11 How widespread is narcolepsy and what causes it?

Narcolepsy affects about 1 person in every 2000 people in most societies, although it is far less common in Jewish populations. The rate of diagnosis varies dramatically from country to country and up to 80% may be undiagnosed in some Western countries. We now know that people with narcolepsy have a lack of a brain neuropeptide called hypocretin (or orexin) and it seems that the brain cells that produce hypocretin become destroyed in narcolepsy. If you think of a seesaw with AWAKE at one end and ASLEEP at the other then hypocretin acts to stabilise the seesaw so one end is up and the other is down. In narcolepsy the lack of hypocretin causes a person to seesaw between AWAKE and ASLEEP. The absence of hypocretin means there is no stabiliser. As narcolepsy can run in families (in about 10% of cases a relative has narcolepsy) in some people with narcolepsy selected genes may be sending a message for these cells to be destroyed. In other cases narcolepsy seems to follow a viral illness (such as a very bad flu) or a head injury and these events may lead to consequences in the brain that reduce hypocretin levels. However, in about half of all the cases of narcolepsy we can't find any event or reason for its onset – it just starts. Studies of identical twins and narcolepsy have shown us that there are cases where one twin gets the disorder and the other doesn't. Thus having the genetic tendency for narcolepsy is not enough. The actual onset must also depend on something else, probably environmental, which we don't yet understand.

***Narcolepsy is caused by faulty brain chemistry.***

Sometimes people confuse narcolepsy with an illness called “sleeping sickness” which is caused by an insect bite and confined to Africa.

Studies about narcolepsy have been helped by the development of animal models of the condition in dogs (especially poodles and Doberman dogs). Narcolepsy was discovered in some dogs and these dogs are being

selectively bred to produce litters where most of the puppies have narcolepsy. This allows a closer look at the chemical activities that may be causing the disorder. The severity of the cataplexy in the dogs is measured by how many

***The excitement of food makes the dogs collapse with cataplexy.***

times they drop down with cataplexy as they run enthusiastically towards their food. No attempts to breed narcolepsy in cats have been made. As a normal, well fed cat can sleep for up to 20 hours a day it would be hard to recognise the difference between normal cat sleeping behaviour and a narcoleptic cat.

## 5.12 How is narcolepsy diagnosed?

If narcolepsy is suspected a doctor will take a careful history of sleepiness, sleep times and the appearance of any other non-sleepiness symptoms of narcolepsy. The possibility that the sleepiness is due to other medical non-sleep related conditions will need to be checked out.<sup>139</sup> Sleepiness due to other sleep disorders like sleep apnoea<sup>140</sup> or periodic limb movements<sup>141</sup> will be investigated in an overnight sleep study.

If narcolepsy is still suspected then the sleep clinic will conduct a test called the Multiple Sleep Latency Test which simply involves measuring sleep<sup>142</sup> while taking four or five short naps at two hourly intervals across the day. They will be looking at how long it takes to go to sleep and whether the patient sometimes fall

***Naps in a sleep clinic can help diagnose narcolepsy.***

asleep with a REM sleep period. This is considered to be the best diagnostic test as people without narcolepsy very rarely fall asleep with a REM period. Narcolepsy is basically a disorder of how REM sleep is regulated. Thus problems may occur with the *dream* part of REM (vivid

<sup>139</sup> See Q5.3 about possible causes of sleepiness

<sup>140</sup> See Q3.10 about sleep apnoea

<sup>141</sup> See Q3.11 about periodic limb movements in sleep

<sup>142</sup> See Q1.14 about how we measure sleep and Q2.7 about sleep clinics

dreaming and hallucinations), the bodily *paralysis* during REM sleep (cataplexy and sleep paralysis) and the *transition* between REM and waking.

### 5.13 How are the symptoms of narcolepsy controlled?

The sleepiness symptom of narcolepsy is usually controlled by the prescription of stimulants, such as the one used to control Attention Deficit Disorder in children, Ritalin.<sup>TM</sup> This increases alertness and makes falling asleep when you don't want to less likely. In teenagers it is unusual for the other symptoms, notably cataplexy, to be very severe and we find that the stimulants will often reduce the chance of cataplexy attacks without the need for other medication as well. Adults with severe cataplexy take tricyclic antidepressants in low doses. Stimulants can produce a range of side effects in some people, including mood swings, and the dosage across the day needs to be carefully monitored. The provision of stimulants for medical purposes is very strictly controlled by the government. Many people with narcolepsy find taking the tablets on an empty stomach helps and not having any later in the afternoon means less interference with their night time sleep.

**Medication will help control the symptoms of narcolepsy.**

The symptoms of narcolepsy, whether diagnosed or undiagnosed, can cause a lot of problems for children and teenagers. They can be branded as lazy and tormented by their classmates. Getting a diagnosis can be a long drawn out process and a misdiagnosis of narcolepsy as depression is not unusual. Teenagers with narcolepsy, or who suspect they may have narcolepsy, should get specialist medical advice and seek out support networks, such as through the internet.<sup>143</sup>

<sup>143</sup> See the internet sites suggested at the end of this book.

## 5.14 Can non-prescription ‘wake up’ substances help alertness?

Any person with sleepiness during the day will find that drinks or tablets containing caffeine<sup>144</sup> and/or guarana will give them an alertness boost. Side effects are common if ‘wake up’ drinks are consumed too often and addiction is a real likelihood. Moodiness or irritability can be a problem as the effects wear off. If the sleepiness is due to lifestyle factors it will be better in the long run to keep more regular hours. If it’s due to a sleep disorder it’s best to get this treated. People with mild narcolepsy report that caffeine helps and some with more severe sleepiness may ‘top up’ the effects of stimulants with caffeine to help improve alertness.

***Some people are chronically sleepy and use caffeine to keep them going.***

Sometimes people eat sweet things to try to give them a bit of a boost. Sleepiness can lead to craving for some sweet things. However, a sugar kick will only help alertness for about 20 minutes and after an hour or so will bring you down, meaning you are sleepier than before. Thus a cycle of eating sweet things on an almost hourly basis can result.

## 5.15 Is napping a good idea?

Taking a nap can be a great way to meet the sleep needs of someone with daytime sleepiness. The afternoon nap has been an established part of many cultures, especially where the climate is hot. However, as people commute farther and farther to and from work and the pace of life quickens, napping becomes a luxury. In some

***Attitudes to naps vary across cultures.***

<sup>144</sup> See Q3.3 for caffeine effects on sleep and the caffeine content of different drinks and foods

cultures it is frowned on as some unnecessary indulgence. Yet for sleep deprived people it can help them get through the day. The term 'power nap' has come into fashion.

However, there are three possible down sides to napping. The first is that if someone has trouble getting to sleep at night, napping during the day will only make the problem worse. Pressure for sleep builds up during the day and helps get to sleep at night. If this pressure is reduced by having a nap, sleep onset might be difficult. The second issue is that once anyone starts napping their body will come to expect it and on the days when a nap is not convenient they will be especially tired in the afternoon. The third problem relates to 'sleep grogginess' which can happen when waking up in the morning<sup>145</sup> or from a nap. Sleep grogginess (or in extreme cases sleep drunkenness<sup>146</sup>) can happen if sleep has occurred when sleep deprived and the body has moved into deep sleep to catch up. The 'power nap' has not empowered, it's caused more grogginess. It may take half an hour or more to recover. If a car is driven in this state the person will not be functioning fully and may be putting themselves and others at risk. The key to a power nap is to keep it brief – set a timer for 15 minutes, in most circumstances this will be before the body moves into deep sleep. If a longer sleep is needed it's best to wake up naturally and then be prepared to wait quite a while after the nap in order to come to full alertness.

***Keep power naps short.***

<sup>145</sup> See Q5.4 for more on sleep grogginess

<sup>146</sup> See Q6.4 for more on sleep drunkenness

## ***CHAPTER 6: Unusual behaviours during sleep***

### **6.1 What unusual behaviours can happen during teenage sleep?**

There are many behaviours that can happen during sleep and most have one thing in common. They arise from an incomplete transition between the waking state and the sleep state. Some occur during deep sleep (part of non REM sleep) and some occur during REM sleep. Sleep specialists call this group 'parasomnias'. (The word means behaviours resembling sleep.) Table 6.1 shows the main abnormal behaviours that can happen during sleep and it can be seen that most of these are likely to happen in the teenage years, either starting then or starting earlier during childhood. Unusual behaviours during sleep are commonly reported by teenagers. In fact 80% of all teenagers report unusual behaviours during sleep and these behaviours would be, in the main, the ones listed in Table 6.1.

***Parasomnias occur frequently in teenagers.***

### **6.2 Why do we sometimes get sleep jerks, or starts, when going to sleep?**

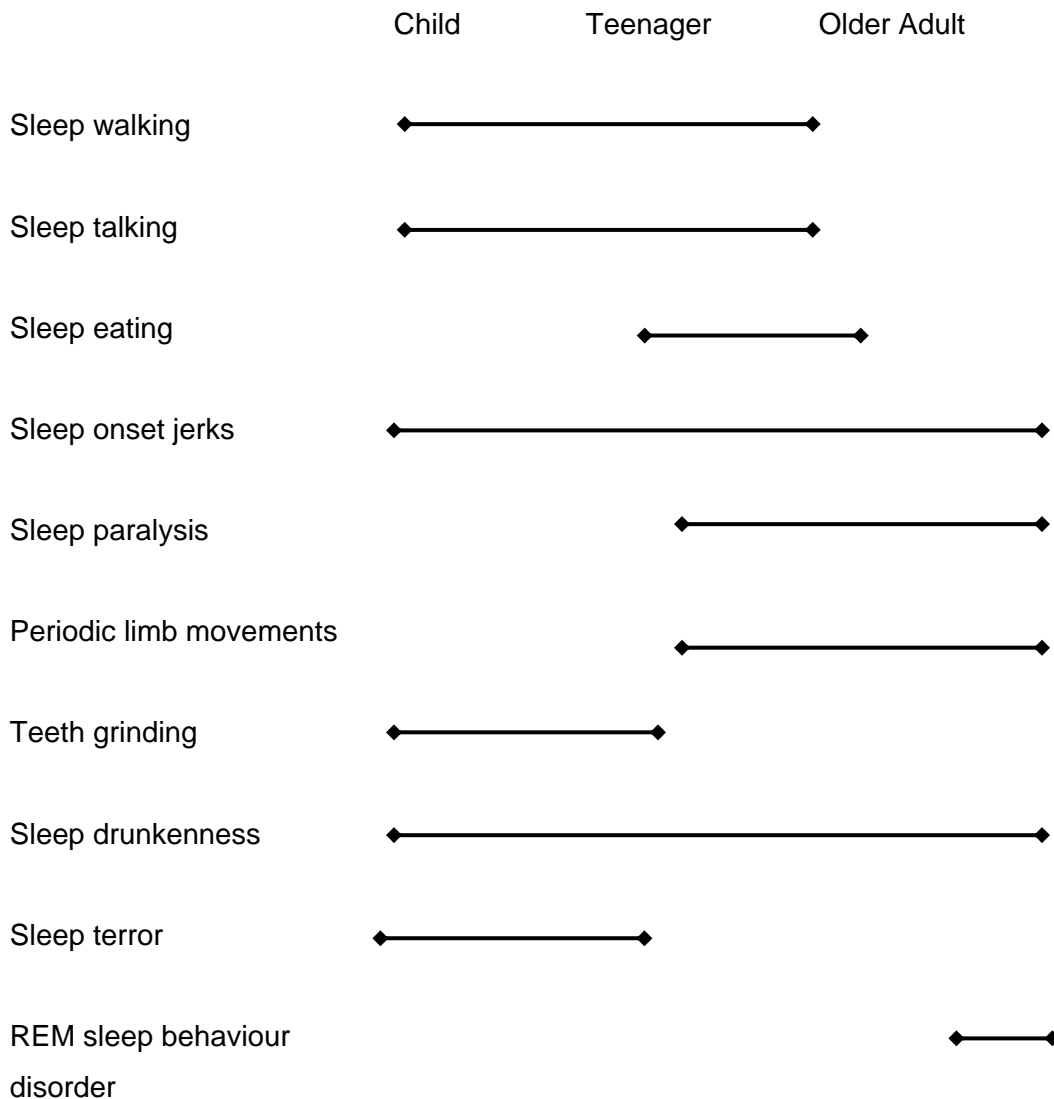
This is a very common experience, with two thirds of all adults having them occasionally. As the body relaxes, so does our muscle tension. Normally our body will move into a drowsy state of sleep at first, called stage 1 sleep and then into stages 2, 3 and 4.<sup>147</sup> Stage 1 sleep is very close to REM sleep in terms of what our brain patterns look like. However, in REM sleep our muscles become paralysed so we don't act our dreams. We think the jerking happens as we fall asleep because the body is

***Jerking happens when the body becomes confused between REM and non-REM sleep.***

<sup>147</sup> See Q1.15 for more details on sleep stages

uncertain about whether it is going into REM or non-REM sleep – with one stage having muscle paralysis and the other not. The interesting thing is that often this jerk will be woven into a dream, like falling off a cliff.<sup>148</sup> A dream of falling off a cliff is often associated with a muscle jerk. The jerks are less likely to happen if your body is getting enough regular sleep and you are relaxed when you go to bed.<sup>149</sup>

Table 6.1: Age and behavioural abnormalities in sleep.<sup>150</sup>



<sup>148</sup> see Q6.2 for more on sleep jerking

<sup>149</sup> See Box 4.1 in Q4.1 or Appendix C for a muscle relaxation program

<sup>150</sup> Adapted from Shneerson (2000) p.152.



### 6.3 What if these jerks also happen during sleep?

In a small group of young people the jerking of their limbs (usually legs) can happen many times during the night. Their legs may twitch or jerk for anywhere between a fraction of a second up to about five seconds, and this twitch may happen several times a minute. Twitches tend to occur in clusters and are more common in the lighter or intermediate stages of non-REM sleep. They may also occur during quiet wakefulness. For the sleeper the problem is that each jerk causes a partial waking up but the person is usually not aware of the problem. Thus their sleep is very restless, fragmented and they will feel unrefreshed in the morning. Daytime sleepiness may thus result.<sup>151</sup>

Frequent jerks during sleep are symptoms of a recognised sleep disorder. This is known as periodic limb movement in sleep disorder (PLMS) and it can occur in people of any age (including childhood), but becomes more common with increasing age. About 5% of middle aged people have it and up to 45% of the elderly.

PLMS is certainly noticeable to any bed partner and they will report leg jerking movements, sometimes even rhythmic body movements and restless sleep.

***Poor sleep  
may be due to  
jerking and  
twitching  
during sleep.***

PLMS is in the same family as restless legs syndrome<sup>152</sup> and is caused by similar things: iron or magnesium deficiency, sleep deprivation or the intake of substances like caffeine, stimulants, antidepressants or alcohol. Treatment should target these issues first. See Case Study 6.1.

<sup>151</sup> See Box 5.2 in Q5.2 for a scale to measure daytime sleepiness

<sup>152</sup> See Q6.3 for details on restless legs syndrome

### Case Study 6.1

Monica was 19 years old and doing art and design at the local college when she got a part-time job working in a chemist shop on weeknights. Work was from 6pm to 11pm. She would rush home after college, eat a snack and go to work. While working she would often grab some chips from the chicken and chips shop next door. (Monica was vegetarian so she avoided the chicken.) She liked the job but started to feel very tired by the end of each week and looked forward to catching up on sleep on the weekends. After a few months she started to sometimes get a horrible feeling in her legs when she was lying down trying to go to sleep. She just couldn't keep her legs still; there was a creepy feeling all over the lower legs. It was such an annoying feeling, it was painful, and all that helped was getting up, walking around and putting cold face washers on her legs. It was happening two or three times a week and seemed even worse just before her menstrual period. One summer long weekend she was sleeping in a tent with her younger sister, Emily. In the morning Emily complained about how restless Monica was all night with lots of leg jerking. Monica herself felt very unrested most mornings and thought she moved around a lot in her sleep.

At the chemist where she worked she mentioned her poor sleep and leg jerking to the pharmacist who looked up her symptoms in one of her big medical texts. From the descriptions they suspected that her sleep problem might be "periodic limb movement in sleep" disorder. They also happened to read about restless legs syndrome<sup>153</sup> which matched Monica's own experience - the two problems often being related. One treatment suggested in the book was correcting any possible iron deficiency. They thought that perhaps Monica's poor diet and her vegetarianism had resulted in her body being very low in iron stores. Once Monica was taking a daily iron and magnesium supplement, her restless legs and jerking stopped happening and she felt much more rested in the mornings.

## 6.4 What is sleep drunkenness and why does it happen?

Sleep drunkenness is an extreme form of the sleep grogginess described earlier.<sup>154</sup> The person is very confused and carries out slow and inappropriate actions, sometimes involving quite complex behaviours.

They are disorientated about where they are, what is happening and what time of day it is. They will resist attempts at control, sometimes quite aggressively. Sleep specialists call these events confusional arousals.

<sup>153</sup> See Q6.3 for more information on restless legs syndrome

<sup>154</sup> See Q5.4 for sleep grogginess in the morning.

Episodes may occur if the person wakes up from a deep sleep. It is more likely early in the night although it can happen at any time in sleep deprived people. Sleep drunkenness happens more in children and young people than older adults because they have more deep sleep. The brain has trouble moving from deep sleep to being alert and brain wave patterns during episodes show features of both sleep and wake at the same time. The sleep drunkenness may last for several minutes and the person may gradually become fully alert. They usually remember little or nothing of the event. We sometimes see such episodes after sleep walking or a sleep terror (see below). Treatment involves reducing the chances of any sleep deprivation by keeping regular hours. Alcohol and some medications may cause more episodes of sleep drunkenness.

***During sleep drunkenness the brain is half asleep and half awake.***

## **6.5 Why do some young people wake up terrified during the night?**

Most of us have heard about children or teenagers waking suddenly, usually in the first part of the night, sitting upright, looking terrified, gasping, crying, perhaps even screaming. They may babble about a catastrophe or a threat but don't usually report having a bad dream. The fear arises from a single horrifying thought (such as the death of a loved one) which they may or may not be able to identify. Sleep terrors happen during non-REM sleep and are not associated with the scary, action-type, vivid dreams, we associate with nightmares<sup>155</sup>, just a feeling of fear. They may even jump out of bed and run around wildly in fear. This is called a sleep terror and they happen periodically in at least 3% of children aged 4 to 12 years. In some children they happen several times a week but each episode usually only lasts for a few minutes. Afterwards there may be

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<sup>155</sup> See the next question for information on nightmares

confusion<sup>156</sup> or the person may go back to sleep. Usually nothing is remembered about the incident the next morning.

Sleep terrors are in themselves nothing to worry about. The main concern is that the person doesn't hurt themselves during the episode, so keeping the bedroom free of obstacles is a good idea. If there is running around then windows should be locked. If a person has frequent episodes they should get plenty of sleep, keep regular sleep hours and avoid caffeine, alcohol and other stimulants. Some sleep terrors are set off by a sudden noise and in such cases earplugs may work. Fortunately, sleep terrors usually disappear after puberty.

***Sleep terrors disturb the observers more than anyone.***

## 6.6 What is the significance of nightmares?

Unlike sleep terrors, nightmares occur during REM sleep, or vivid dreaming. Thus they are more memorable, complex and coherent. During a nightmare breathing, heart rate and sweating increase but the thrashing around that is sometimes shown in films doesn't happen because the person is in REM paralysis.<sup>157</sup> Nightmares will be remembered only if the person wakes up.

***Retelling a nightmare can be therapeutic.***

People try to interpret nightmares in the same way they do dreams<sup>158</sup> and many possible interpretations are possible.

Nightmares can be common throughout childhood and the teenage years and their frequency seems to increase across the age span from 12 to 21. About a third of University students report having nightmares at least once a month. Reports are more likely in females across all ages. While nightmares can be very frightening, they very rarely in themselves suggest

<sup>156</sup> See sleep drunkenness in the previous question

<sup>157</sup> See Q1.12 for more details on REM sleep

a medical problem. In many cases they happen for no particular reason, although being sleep deprived does make them more likely. They may occur with certain medications that can lead to a REM rebound.<sup>159</sup> Some illegal drugs,<sup>160</sup> alcohol,<sup>161</sup> cold and flu tablets, anti smoking (nicotine) patches and sleeping tablets, for example, can lead to nightmares during use or when stopping. We know that in some cases recurring, intense nightmares<sup>162</sup> can follow a traumatic experience and may suggest the person is under a lot of stress. If this is the case they should seek help for their waking stress and anxiety.<sup>163</sup> If nightmares are causing a problem then getting plenty of sleep is also important. Writing out the events of a recurring nightmare or retelling it to others seems to have a therapeutic effect, reducing the emotion associated with the nightmare. Some dream researchers argue that if a troubled person has a dream that wakes them up, especially a recurring nightmare, they should retrieve the last image of that dream and create a more positive ending. For example if a person felt overwhelmed by an event they should try to dream of themselves being resourceful and changing things so they can cope. A similar idea is behind hypnosis therapy. Through hypnosis the person is taught how to change their frightening dreams and may even invent some clever, dramatic events or a “protector” in their dreams to keep them safe.<sup>164</sup> Case Study 6.2 describes the successful treatment of a recurring nightmare using such a technique.

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<sup>158</sup> See Chapter 7 for more on dream interpretation

<sup>159</sup> See Q4.7 about sleeping tablets and REM rebound (Box 4.3)

<sup>160</sup> See Q3.6 for information on drugs

<sup>161</sup> see Q3.4 for more on alcohol and sleep

<sup>162</sup> See Q7.18 about recurring dreams

<sup>163</sup> See Q3.14 about stress and its effects

<sup>164</sup> See also lucid dreaming in Q7.22

**Case Study 6.2<sup>165</sup>**

Sabina came to the psychologist complaining of a recurring, frightening nightmare that had begun two years earlier when she was first separated from her live in boyfriend. They happened two or three times a week and she found it hard to sleep after being awoken by it, so she often felt tired during the day. The nightmare went like this: She hears a noise and realises that a man is breaking into her flat. She flees out the back door, but the man, who is large and dressed all in black clothing with a black stocking mask, chases her. He is carrying a large knife and she is terrified. She runs until she is exhausted but the man is still there and approaches her with the knife raised. She feels she is going to be murdered and awakes frightened and shaking. The psychologist felt that it was appropriate to try to treat Sabina using hypnosis. A guided self-hypnotic approach was used, where Sabina was taught the technique in the clinic and played a tape recording to herself prior to bedtime. This tape led her into a state of deep relaxation and then suggested to her that since it was her nightmare she could control the outcome in any way she wished. She could try to escape from the man, or trap him. One suggestion was that if she ran in a different direction from the one she usually ran in, she would come to a deserted fun park. In this fun park she could lure him into the Hall of Mirrors where he would be confused by all the images of her, and she could escape, locking the door behind her. The tape suggested that she replay her nightmare in her mind while still awake, as if it were on TV and change the ending to allow her to escape. She should then do the same thing if she experienced the nightmare once asleep. Sabina reported that the nightmare happened during the next week, but was not as intense as it normally was and she had a feeling of control. She enjoyed luring the attacker into the Hall of Mirrors and reported that in her dream she had called the police and he had been taken away and locked up. Follow up sessions helped her with overall relaxation<sup>166</sup> and coping with any setbacks. She continued to listen to the tape for a few weeks and reported no further nightmares on that theme. Over the next three months Sabina continued with the self hypnosis and had some other dreams that made her anxious, but she used the same technique of manipulating the outcome of the dream to a harmless conclusion.

<sup>165</sup> Based on a case study in Kennedy (2002).

<sup>166</sup> See Box 4.1 in Q4.1 or Appendix A for a muscle relaxation program

## 6.7 Can we have hallucinations and still be normal?

Yes, hallucinations can simply be the dream part of REM sleep appearing when awake, sleepy or half awake/half asleep. They may be extremely vivid and realistic, so much so that it may be impossible to tell whether it was real or 'dreamt'. The content may be visual images, such as indistinct figures or sounds, with voices or repetitive noises. They may involve sensations of floating, flying or pressure on the body. There may be fear, such as seeing an intruder or something simply ridiculous. One hallucination experienced repeatedly by one man was a herd of elephants crossing his path as he drove down the freeway. Hallucinations are normally associated with being sleep deprived or having a disorder of sleepiness such as narcolepsy.<sup>167</sup> As they are also a symptom of schizophrenia, this possibility may need further investigation in some cases, especially where the person is also displaying inappropriate emotions and/or behaviour.

***Hallucinations can involve any sense, sensation or emotion.***

## 6.8 Why do some people feel completely paralysed sometimes?

Paralysis of the outer muscles of the body is another part of REM sleep that may appear during waking up, or, less often, on going to sleep. During such 'sleep paralysis' the person is unable to move, but is alert about what is going on. During an episode a person is conscious but physically their body is still in REM sleep and thus paralysed. They usually feel wide awake and have a fully functioning memory. However, sometimes they can have dream like experiences and /or hallucinations, imagining they are dying, having a heart attack or even being under the

***In sleep paralysis your body is still in a dream but you are awake.***

<sup>167</sup> See Q5.10 to Q5.13 for more on narcolepsy

control of some powerful alien-type force. Descriptions of out of body experiences or alien abductions may be sleep paralysis with hallucinations. During an episode they may think they have called out, when in fact they have been unable to speak. The episode doesn't usually last very long, no more than a few minutes but it can seem like an eternity. Sleep paralysis experiences are often terrifying. In one case a woman described her experience as follows:

*I woke up totally unable to move. Then, to my horror, I found a creature, which I imagined was the devil, licking my neck.*<sup>168</sup>

Episodes will end of their own accord and being touched will also bring a person out of it. For strategies to help control and prevent episodes of sleep paralysis see Box 6.1.

Sleep paralysis is surprisingly common during the teenage and young adult years, with up to half of all people in this age group having at least one episode. Males and females are affected equally and in some cases it runs in families. If it is frequent and ongoing daytime sleepiness is also a problem then the possibility of narcolepsy should be considered.<sup>169</sup> The main

**Many young people have experienced sleep paralysis.**

treatment is to avoid becoming sleep deprived and be reassured that an episode will always end quite quickly. The stress and anxiety of sleep paralysis can make it seem as if episodes last for a long time.

## **6.9 Is teeth grinding during sleep something to worry about?**

This problem is less common during the teenage years than in childhood. The person will do repetitive chewing movements with grinding or even

<sup>168</sup> quoted in Hearne and Melbourne (1999), p 52.

<sup>169</sup> See Q5.10 to Q5.13 for information on narcolepsy



crunching sounds. The chewing movements happen in clusters (usually lasting 5 to 10 seconds) and the clusters may happen many times during the night. It can lead to half waking up or sometimes complete awakening. The person may report a headache or jaw pain in the morning. It can cause dental problems and a dental check up is a good idea if it seems to be happening a lot. In medical circles it is called “bruxism”. Getting plenty of regular sleep and decreasing waking stress will usually help.

***Reduce stress  
to reduce  
teeth grinding.***

#### Box 6.1 Living with sleep paralysis

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Control during an episode: As soon as you feel yourself unable to move tell yourself that it's just an episode of sleep paralysis, just a natural event. Relax as much as possible and reassure yourself that it's just like a dream, quite safe and harmless. Your body is still in the dream but your mind has moved out of it. Don't try to fight it. Instead try to move your mind back to the dream, back to where your body still is. Make any dream imagery pleasant. Relax and breathe slowly and try to sink back into a more dreamy sleep state. As you drift into a more dream like state you will wake up naturally, without the paralysis, when the dream ends.

Prevention: If you often have sleep paralysis go over the above plan regularly before you fall asleep so if you do find yourself paralysed you will have the strategy well prepared to implement. Most importantly – keep regular sleep hours, don't let yourself become too sleep deprived and try to reduce the amount of stress in your life.

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## 6.10 Do some people get violent while being sleepy or asleep?

If people are both partly awake and partly asleep (such as with sleep drunkenness,<sup>170</sup> sleep terrors<sup>171</sup> and sleep walking<sup>172</sup>) and another person

<sup>170</sup> See Q6.4 about sleep drunkenness

<sup>171</sup> See Q6.5 about sleep terrors

<sup>172</sup> See Q6.12 about sleep walking

who is awake tries to physically restrain them, the sleepy person can sometimes react violently. It is best to try gentle redirection without touching them.

There is a sleep problem where the person starts to act out their dreams. They are in dream sleep but the paralysis of their body is incomplete or absent. In mild cases of this “REM sleep behaviour” disorder there are leg and body movements with twitching and jerking and associated dreams may be remembered. If the episodes are more severe the movements may include actions like waving arms or hands, laughing, talking, yelling, punching, biting and even getting out of bed and kicking, running or jumping. Emotions can seem intense and the movements can be violent. Dream reports during such episodes may be about being threatened, running away or fighting back. The danger is, for example, that the man dreaming about dealing with an intruder punches his sleeping wife. As the person is in REM they can usually be woken quite easily and that the behaviour can hopefully be quickly stopped.<sup>173</sup>

***Acting out  
dreams  
can involve  
violence.***

Usually these events happen for no known reason but sometimes they are associated with REM rebound<sup>174</sup> due to the action of certain drugs or alcohol. If episodes are severe and occur regularly for no apparent reason it is important to see a sleep specialist for help. This disorder is rare in teenagers and more likely in males aged over 50 years.

### **6.11 Why does sleep talking happen?**

Sleep talking is so common that it is not considered abnormal. Among high school students about a third report sleep talking at least once a week, and this is presumably only based on what others have observed.

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<sup>173</sup> However, see Box 7.7 in Q7.14 about a tragic outcome of such behaviour

<sup>174</sup> See Box 4.3 in Q4.7 for more on REM rebound

It is more common in childhood than in the teens and occurs equally in males and females.

It doesn't happen during dream sleep or deep sleep, but in the lighter and intermediate stages of sleep. Sleep talking is likely to be mostly incoherent short parts of sentences, spoken with no emotion. However, there are some reports of people holding a conversation while asleep, with no recall on waking. (Presumably secrets could be uncovered during such conversations.) Sleep talking is associated with a partial waking arousal but there is no memory of the talking. It may be worse if the person is sleep deprived.

***People who sleep talk don't remember doing so.***

## **6.12 What causes sleep walking and what should be done about it?**

Sleep walking is more common in teenagers than in any other age group with 8% of high school students reporting it 'habitually'. Brain waves recorded while sleep walking show a mixture of deep sleep, drowsy sleep and wake patterns. Sleep walking may happen for no obvious reason, it can run in families, it may be triggered by certain medications and in some people (but not most) frequent episodes can be related to bottling up emotional stress.

Sleep walking is most likely to happen in the first third of the night (when we expect deep sleep). Most sleep walkers will move about with their eyes open and can perform routine, well learnt things like opening doors and may say or mumble some words. There have been claims of more complex behaviours being successfully completed while sleep walking, such as driving a car and even murder (see Box 6.2). Episodes generally last from 5 to 15 minutes. There is little awareness of what is going on and they

***The brain and body is partly in sleep and partly in wake while sleepwalking.***

may not recognise family or friends. Sometimes they will go to the toilet in the wrong place (this is more likely with boys) due to confusion. This may wake them up and they will be embarrassed. If the person doesn't wake up during a sleep walking episode they won't remember anything because memories can't be formed during this mixed sleep/wake state. In some people the sleep walking episode is not calm. The person is agitated, perhaps frantic, and they will hurry around in a confused and possibly fearful state. It may take them up to 20 minutes to calm down.

If a sleep walker is calm they may allow themselves to be gently guided back to bed, being quietly told 'Go back to bed now'. If they resist this, either passively or aggressively, then its best to let the sleep walking take its course, just ensuring that any danger is minimised. Don't try to wake them, don't question them and keep any attempts to control them to the minimum that they will comply with, or to avoid danger. In many cases the sleep walkers will return to bed themselves.

Young people who are prone to getting out of bed while asleep should not be sleeping on a top bunk and any clutter in areas where they might walk should be taken away. Putting a bell on their bedroom door can wake others when they are having an episode and windows and external doors should be locked. People have sleep-walked out into the snow and locked themselves out.

Parents often worry that sleep walking may mean their son or daughter is troubled or stressed. This is not usually the case and they should only be concerned if the sleep walking is very frequent, the sleeper is difficult to handle and safety is a worry. Getting plenty of sleep, having regular bedtimes and avoiding substances that affect sleep<sup>175</sup> will reduce the number of sleepwalking episodes.

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<sup>175</sup> See Q3.3 to Q3.6

### 6.13 What if bed wetting persists?

Bed wetting that persists beyond early childhood can be a particularly disruptive and traumatic condition. Five percent of children still experience bedwetting at age 10 years. As the teenager takes on more adult patterns of sleep (at about the age of 16 years), including less deep sleep, the problem may go away. If it continues into adulthood there is usually a medical cause. In children it can be a result of a lack of responsiveness of the brain to the signals from the bladder, a non-compliant bladder or failure to wake up from deep sleep. Life stresses may be contributing to the problem. In some cases bed wetting may be associated with sleep apnoea.<sup>176</sup> There is quite a lot of literature available on behavioural methods for helping bed wetting. Some treatments include strengthening relevant muscles that control urine flow, or alarms that alert the sleeper that the bed has just been made wet (with the aim of conditioning the sleeper to waking up to the feeling of a full bladder). A teenager with a bedwetting problem should definitely see a doctor, both to see if the problem is medical and because the problem itself can cause trauma. Bed wetting should not be confused with wet dreams.<sup>177</sup>

***Bedwetting happens in deep sleep.***

### 6.14 Is middle of the night snacking a sleep disorder?

It depends. If the person remembers getting up in the night and eating or drinking while awake then it is just ordinary behaviour that happens in the middle of the night. Some people with sleep problems that wake them up may do this and say it helps them get back to sleep. Sweet snack foods are preferred like biscuits and doughnuts. Others with the eating disorder of bulimia nervosa or Kleine-Levin syndrome<sup>178</sup> may eat in the middle of the night during a severe phase. In one severe case of binge eating the young person would get up as many as six times per night and went from

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<sup>176</sup> see Q3.10 for details on sleep apnoea

<sup>177</sup> See Q7.4 for information on wet dreams

<sup>178</sup> see Q5.9 for details of the Kleine Levin Syndrome

a size 14 to 22 in one year. If a person is binge eating during the day or the night they need to get help for this problem.

Middle of the night snacking can, however, happen as a form of sleep walking. Within the population it is most often seen in young adult females (up to 4% of all older teenagers). It usually happens in the first third of the night and is a partial arousal from deep sleep. The person is likely to be unaware of their snacking during the night and effectively sleep walks to the fridge. It may occur almost every night. The dangers of this activity are possible choking and leaving the stove on if there is some cooking.

***People can snack while sleep walking.***

Connecting bells or alarms to the fridge door can wake up other sleepers if safety (or unwanted weight gain) is a concern. Eating a large meal during the evening doesn't seem to make much difference. Medication may help in extreme cases.

### **6.15 Can epileptic attacks occur while asleep?**

Yes, many different types of epilepsy can occur during sleep. The usual complaint is that a parent or bed partner sees the sleeper having frightening, disturbing, repetitive movements during sleep. Sometimes grasping, punching, shaking or kicking can occur. During an episode the person cannot be talked with. Many, but not all, types of epilepsy that happen at night are also likely to happen when the person is awake. Of the sleep disorders, epilepsy attacks may probably most easily be confused with periodic limb movement in sleep disorder<sup>179</sup>, sleep terrors<sup>180</sup>, and REM sleep behaviour disorder<sup>181</sup>. The key difference between the first two of these and epilepsy is that during epilepsy the repetitive limb and body movements are usually more intense and complex. Fast, repetitive limb

***Epilepsy and sleep disorders can be confused.***

<sup>179</sup> See Q3.11 for information on this disorder

<sup>180</sup> See Q6.5 about sleep terrors

jerking and body stiffening is possible. Sometimes the person will wake up before the epileptic episode happens and remember the event. In REM sleep behaviour disorder the person will usually report a vivid dream episode, whereas no such mental imagery happens with epilepsy. If the episodes recur and epilepsy is suspected then an observer should get as detailed a description of the episodes as possible and consult a doctor.

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<sup>181</sup> See Q6.10 about REM sleep behaviour disorder

## ***CHAPTER 7: All about dreams***

### **7.1 How do dreams change from infancy to adulthood?**

When we are very young we don't have a rich or imaginative dream world. In general, young children lack the maturity to think deeply about their own experiences, create vivid images or complex stories when awake and this is also the case when asleep and dreaming. Thus the dreams of toddlers tend to be very plain and unemotional. Two main themes for preschool children are dreams of animal characters and dreaming of their own body states such as being asleep or hungry (see Box 7.1).

Box 7.1 Dream of 4 year old boy, Dean<sup>182</sup>

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I was dreaming I was sleeping at a drink stand...where you get Coke from. [*Was this some particular stand that you know, or was this just made up in the dream?*] Just made up. [*Was there anyone else in the dream beside you?*] No. [*Were you doing anything besides sleeping?*] No.

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Dreaming improves with age in children. As children move into their teens their level of thinking develops and they report more abstract, complex and imaginative dreams (see Box 7.2)

The researchers who conducted these major studies on children's dreams became convinced that the differences in dream reports at different ages were not because the teenagers had more language skills than the young children and could thus describe their dreams more vividly and imaginatively. Instead, the changes were seen as a direct result of our ability to think better as we get older. In other words, dreaming capabilities unfold as other complex mental skills develop.



Box 7.2 Dream of 14 year old girl, Emily. <sup>183</sup>

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I had a dream that I had to do a dance in front of a whole bunch of people. And I had different socks, and I had great big holes in the bottom of the socks. And I didn't know it. *[But the other people could see them?]* Yes. *[Where was all this supposed to be happening? Where was the dance?]* It was on a stage, kind of ... a made up place. There were a whole bunch of people that were in the show that were watching. I think it was before an audience too, but I couldn't see the audience. *[Did you recognise any of the people that were there?]* No. They were men and women. *[No kids your own age? Just older people?]* Yes. *[Did you have any feelings?]* No...I felt embarrassed after I found out. *[How did you find out?]* I looked and saw them (the socks).

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## 7.2 How many dreams do we have each night and when do they happen?

REM periods happen about every one and a half hours during the night, so there are five or six REM periods each night. REM periods that happen more towards morning are longer, possibly lasting up to an hour. We believe that each REM period may have more than one dream sequence in it but this is not all that easy to know for sure. This is because we can only remember the dream that we are awoken from. We may or may not have a different dream when we go back to sleep as this depends to some extent on how fully we woke up. If you wake up during a dream, needing to go to the bathroom, you can try to keep your dream going while moving around. This will help you return to sleep very quickly.

<p><b>We dream more in the morning hours of sleep.</b></p>
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While it is convenient to think of vivid dreaming as only happening during REM sleep, just to make things complicated, it seems likely that we do

<sup>182</sup> Foulkes (1982) p. 66.

<sup>183</sup> Foulkes (1982) p. 262.

sometimes have some vivid dreams when we are in non-REM sleep<sup>184</sup>. Vivid dreams may happen when we are just dropping off to sleep (which is almost always measured as being non-REM sleep). Some of the greatest dream stories are from short afternoon naps, when our brains are showing that we are in non-REM sleep. We are still a long way from understanding completely the relationship between our recorded brain waves (notably REM and non-REM sleep) and our mental activity (full dreams versus rambling thoughts).

### 7.3 Are dreams of falling down suddenly normal?

Dreams of falling unexpectedly are often reported, especially as you are dropping off to sleep. Often they will be accompanied by a sudden jerk or “start”. Falling dreams are reported more by females than males. One possible explanation for this dream sensation is that as our muscles relax as we go to sleep, some process in our normal nerve transmissions gets interrupted and we experience this as a sudden jerk. Because the brain has a strong desire to make sense of all the signals it receives, it translates this into a dream of falling. If such dreams are a regular problem doing the relaxation exercises in Appendix C before going off to sleep may help.

***Falling down in dreams with a jerk is a common experience***

### 7.4 What are wet dreams?

Wet dreams are a normal part of going through puberty. In males a wet dream means that liquid sperm is released (ejaculated) from the erect penis during a dream. We usually only think about wet dreams in relation to males but we know that in females the clitoris may become swollen and moist during some dreams. Wet dreams occur more often in younger than

<sup>184</sup> See Box 1.5 in Q1.11 for examples of typical dreams in REM sleep and non-REM sleep.

older people, perhaps because better control over ejaculation occurs with age. The number of wet dreams decreases markedly by the mid 20's.

As erections of the penis happen regularly in REM sleep (4-5 times a night), wet dreams occur then. Regular REM sleep erections of the penis continue across the lifespan after puberty and seem to be related to a variety of active bodily changes associated with REM sleep.<sup>185</sup>

Wet dreams may or may not be linked to a dream involving sexual imagery. Similarly, a dream with erotic sexual content may or may not lead to a wet dream.

***Wet dreams are not necessarily about sex.***

The number of wet dreams experienced is different for different teenage boys and also changes with the seasons. It is believed that dreams with sexual content are not something we learn to have, but are driven by our biology.

Sometimes the semen on the bedclothes from a wet dream may be confused with bedwetting.<sup>186</sup>

## 7.5 Are dreams showing us our wishes and fantasies?

We use the word “dream” in everyday language to indicate things we want eg ‘I dream about owning my own car.’ I dream about going out with \_\_\_\_\_.” I dream of travelling.” The idea that dreams are an indication of our wishes first became popular about a hundred years ago.

Sigmund Freud believed that dreams are created because we repress, or hide, our wishes. Dreams provide a way to fulfil our wishes in our imagination. Sometimes it's hard to see how our dreams cater for our wishes and this is believed to be because our mind uses symbols

***Some dreams are fantasies that sleep keeps “safe”.***

<sup>185</sup> See Box 1.6 in Q1.12.

<sup>186</sup> see Q6.13

in dreams. For Freud there was no fixed system of what different symbols meant, for most things it was different for different people. However, some symbols were common and could be generally applied to the dreams of different people. To help interpret a dream Freud would take each item or event in a dream and trace it back to the life experience of the dreamer and try to work out the wishes connected to that aspect of the dream. The wish for love could be symbolised in a dream by shoes, hats, walking on stairs, flying through the air or travelling in a car.

Carl Jung also saw dreams as wish fulfilments but believed that a common function of a dream is as a compensation for “one-sidedness”. Thus, dreams help set up a balance and act as an outlet for our wishes. So poor peasant girls would dream of a handsome prince and young women with eating disorders dream vividly of eating lots of food. In this way dreams, according to Jung, are our fantasy building system and normally help us to be happy.

## 7.6 What other meanings may our dreams have?

Perhaps not all our dreams are showing our conscious or unconscious wishes. Our daydreams tend to be heavily built around things we wish for – but the content of our dreams when we are asleep seems to be much more varied, unexpected, bizarre, and sometimes distressing. Are they really wish fulfilments, if only we could interpret them properly? Or are the meanings of our dreams more complex? Perhaps there is no meaning at all? Box 7.3 summarises many different ideas about the nature and function of dreams across different cultures and throughout recorded history. You will notice that the idea of dreams as wish fulfilments is only one of many ideas about the role of dreams.

***Dreams are more complex than daydreams.***

**Box 7.3** Different views on dreams

Dreams variously seen as:	Dreams can:	Origin of these ideas:	Time period of:
Messages from Gods	<ul style="list-style-type: none"> <li>deliver warnings</li> <li>foretell the future</li> <li>answer queries (eg health cures)</li> </ul>	<ul style="list-style-type: none"> <li>early Egyptians</li> <li>early Greeks</li> <li>Old testament of the Bible</li> </ul>	8 <sup>th</sup> century BC to the present
Separation of the soul	<ul style="list-style-type: none"> <li>provide entry for the soul to spiritual world</li> <li>enable conversations with the dead or the devil</li> <li>lead to disease if a soul enters the wrong body</li> </ul>	many ancient societies in China, Greece and the North American Indians	through-out time
Reflection of the psyche (mind)	<ul style="list-style-type: none"> <li>be a window into the unconscious</li> <li>fulfil wishes related to our childhood and motives (eg sex)</li> <li>reflect our ideas on life/death, love/hate, good/evil etc.</li> <li>relate to our will, memory, mental activity and impressions</li> <li>be a source of artistic/creative inspiration</li> </ul>	<ul style="list-style-type: none"> <li>Lichtenberg</li> <li>Freud</li> <li>Jung</li> <li>Hervey de Saint Denis</li> <li>Samuel Taylor Coleridge</li> </ul>	18 <sup>th</sup> century to the present
Inconsequential bodily disturbances	<ul style="list-style-type: none"> <li>arise from “vapours in the belly”, like overeating</li> <li>be a natural disturbance</li> </ul>	<ul style="list-style-type: none"> <li>Plato,</li> <li>Aristotle</li> <li>Chaucer</li> <li>Locke</li> </ul>	Earliest times to 18 <sup>th</sup> century
More or less meaningless by-products of REM sleep	<ul style="list-style-type: none"> <li>reprogram our genetic individuality</li> <li>delete superfluous memories</li> <li>consolidate memories and learning</li> <li>promote brain growth</li> </ul>	<ul style="list-style-type: none"> <li>Jouvet</li> <li>Crick and Mitchison</li> <li>Hobson and McCarley</li> <li>Evans</li> </ul>	20 <sup>th</sup> century to present

## 7.7 Can dreams reveal the future?

This is a popular idea, often linked (especially in earlier times) to dreams being a form of communication from a god or gods. Most people who research such questions have concluded that there is no reason to suspect that dreams can foretell a future event. The most disturbing

***Our fears  
can  
influence  
our dreams.***

dreams are those in which the dreamer or someone the dreamer loves dies or leaves. It is said that these may occur because the person has a deep seated fear of such an event and the dream, for reasons we don't understand, is created out of this fear. On the rare occasions that a dream does foretell an event that actually happens we don't know if it is just a coincidence or not. Millions of events happen every night in dreams that do not come true.

## 7.8 Can dreams tell us things that are important?

In modern times stories of crimes being solved by information received during a dream are popular. One such story is retold in Box 7.4. If such stories are indeed true, the question becomes – is the information obtained a true vision involving psychic forces we don't understand, a coincidence, or a result of the brain putting together clues in new, creative ways in a dream? What must be remembered, of course, is that a dream that solves a crime is remembered, popularised and retold, while the many dreams that lead people on fruitless searches are quickly forgotten.

***Sometimes  
police do act  
on information  
from dreams.***

**Box 7.4**<sup>187</sup> The Red Barn mystery

In 1827 Maria Marten, of Suffolk, England ran away with William Corder, a farmer, who betrayed her, murdered her and buried her under the floor of the family barn. Corder stayed away from the Marten family but wrote to them saying his wife was well, so for nearly a year nothing was suspected.

One night in April 1828, Maria's mother dreamed she saw the murder and the burial of her daughter under the barn floor. Mr Marten, on account of what his wife had dreamed, broke up the barn floor and found the body in a sack, very decayed. They were able to identify the body from the position of two missing teeth. Corder, who was now married and living in Essex, was arrested and tried. He confessed to the murder in prison and was executed in August 1828.

The early Greeks believed that a sick person could receive important information (via the gods) on how to be healed. They developed elaborate procedures to encourage such divine messages of “healing dreams” and people were trained to interpret visions. In some early cultures those who received visions were highly respected (see Box 7.5).

**7.9 What do we know about our senses during dreams?**

An early record of 300 dreams found that two thirds of dreams are mainly visual, a quarter involve sounds, but only a small number include the sensations of movement, taste or smell.

People awoken during a dream report colour images in about a third of all dreams. It has been said that when we are awake we think in ideas, but in sleep we think in pictures.<sup>188</sup>

***Most  
dreams  
are  
strongly  
visual.***

<sup>187</sup> Ratcliff (1923) p. 55

<sup>188</sup> German theologian, Friedrich Schleiermacher, 1862.

**Box 7.5** Importance of Visions<sup>189</sup>

Visions were considered by early Central American pre Mayan and Mayan cultures as important. They helped guide the people in their individual lives and inform the whole society about impending disasters or other major events. Methods to induce visions included

- fasting
- being deprived of sleep
- chewing coca leaves
- wrapping the skin of a newly killed animal around a diviner's neck and half strangling them until they lose consciousness

Young people entering puberty had to fast as part of their initiation into adulthood. Dreams that occurred while fasting were interpreted to show the whole future life of the teenager.

While we dream in REM sleep our eyes move back and forward some 40 times a night but it seems that these movements are not related to what we are experiencing visually during our dreams. In other words if we were dreaming of watching a tennis match our eyes would not be moving rhythmically back and forth. We know that blind people dream but that people who have been blind since birth have no visual imagery. In general the amount of visual imagery reduces the longer a person is blind.

Our sense of time seems to remain fairly intact while we are dreaming. So dream time and real clock time correspond closely.

**7.10 Are all dreams emotional?**

Nine out of ten adult dreams contain emotions, but most are low level emotions such as feeling pleasantly happy or a bit anxious. When we wake people up while they are dreaming most people report pleasant, positive dreams. But some dreams can involve very strong emotions,

<sup>189</sup> Hearne and Melbourne (1999) p. 20



stronger than what we would normally experience while awake and yet we don't wake up. A study of University students reported that three quarters had at least one bad dream (with strong unpleasant emotions but no waking up) during a one month period. About half of this group also had nightmares (where they did wake up). The strongest, most often reported emotion in bad dreams or nightmares was fear, but anger, sadness and frustration were all reported and could be felt as intensely as fear. Bad dreams are most likely to happen in the first part of the night. People who are in an emotional crisis may experience the same emotions while asleep and dreaming as while awake.

***Unpleasant emotional dreams are quite common.***

Dreams can be experienced as very life like and many people have lain fearfully awake at night, uncertain as to whether the intruder they dreamt about was actually in the house or not. You can read about a terrible confusion between highly emotional dream images and reality in Box 7.6.

Box 7.6 Incident reported in 1901<sup>190</sup>

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A sleeping father fancied that the child beside him was a wild beast about to spring. He picked up the peacefully sleeping child next to him in a frenzy of fear and dashed his brains against the wall. He was horrified when he realised his mistake, but was tried for wilful murder. The court acquitted him, arguing that he could not be responsible for a crime done in his sleep.

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### **7.11 What if you die in your dreams?**

This question often intrigues young people. Usually if you die in your dreams the shock wakes you up. But what if you stay asleep? A researcher who has spent their adult life studying people's dreams said

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<sup>190</sup> Ratcliff (1923) p. 3

they had only ever personally come across three people who had reported dying in their dreams and not waking up immediately. Two of these people said they went on to experience a ‘quietness’ and assumed that this was their death. One woman, who was preoccupied with life after death issues at the time, dreamt of dying and then entering a typical heavenly scene, with white angels and harps. There are also reports of people experiencing their death in a dream and then having what might be described as an “out of body” experience where they look down on their own body. Sometimes this can be associated with sleep paralysis.<sup>191</sup>

***You can dream of your own life after death.***

## 7.12 Can dreams help you work through problems?

Yes, it is possible that they can. A major study of people who were going through a divorce and felt depressed found that, on the whole, those people who reported rich, emotionally charged dreams (involving people associated with their divorce) were more successful in working through their depression. Those who stayed the most depressed were more likely to report flat, irrelevant dreams or could not recall their dreams at all<sup>192</sup>.

People with post-traumatic stress disorder (such as survivors of war trauma) tend to report the same, recurring dream of the trauma<sup>193</sup> – often described as like a video being replayed. It is believed that for these people the trauma has changed the way their brain works during dreams. The illogical and bizarre associations we know normally happen in dreams<sup>194</sup> no longer occur. We think the recurring dream<sup>195</sup> may be slowing down the person’s recovery because the brain is not making the events have new associations through dreaming.

***Dreams may be therapeutic***

<sup>191</sup> See Q6.8 for information on sleep paralysis

<sup>192</sup> Cartwright (1996).

<sup>193</sup> See Q6.6 about nightmares of, and therapy for, nightmares

<sup>194</sup> See Q7.16 about why dreams are so bizarre

Other dream specialists argue that the key to helping people who are troubled in some way is to help them work through their problems, the true nature of which can best be revealed through dream interpretation. This can be done by the individual (through keeping a dream journal and thinking about how the dreams link to the trauma) or through therapy.

Many cultures rely on the correct interpretation of dream symbols to understand the meaning of a dream. Others argue that it is difficult to generalise dream symbols across different

***Symbols may hold the meaning of a dream.***

people, as the true representation of most symbols is highly individual or possible culturally bound.

### **7.13 Where do the things we dream about come from?**

It is generally agreed that the content of most of our dreams come from our waking memories. We store memories of all our experiences – including people, events, locations, times, motions, action sequences, thoughts, emotions, smells, tastes and behaviours. During sleep these are somehow “tapped” to create dreams but the different elements of the original memory become dissociated, or separated, because different aspects of the same experience are stored separately.

Recent memories frequently appear in dreams. People often dream about experiences that can be traced to happening on the day before they went to sleep. Interestingly, there is a tendency, especially in females, to also dream about experiences that happened 5-9 days before their dream.

Some researchers believe this may relate in some unknown way to the female monthly menstrual cycle.

Images from certain computer games played during the day have a high chance of appearing in dreams that night. Nine out of ten people who had

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<sup>195</sup> See Q7.18 for more on recurring dreams

played the skiing game “Alpine Racer” reported dream images of skiing when they were awoken just after they had gone to sleep. Similarly, 75% of players of the “Tetris” game reported seeing Tetris pieces falling down in their dreams, just as they do in the computer game. Amazingly, these results were also found in people with major memory problems (amnesia).

## 7.14 Are all dreams related to our waking lives?

Some dream researchers argue that not all dreams are from waking memories, some may come from links between the body and the unconscious. In particular, the unconscious may receive information

***The body, the unconscious and dreams may all be linked.***

about bodily illnesses (well before they are diagnosed) and this information may appear in a dream, either in a symbolic or direct way. Box 7.7 describes a symbolic dream associated with a hidden medical problem.

### Box 7.7 Dreams and hidden illness<sup>196</sup>

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I dreamed that I was sleeping on a water bed but that it developed a leak. I had a finger in the hole trying to stop the water escaping. I was taken into hospital a few days later with a cyst near my navel.

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Perhaps the unconscious is also involved in the mystery of certain dreams reportedly running in families. There are reports of identical twins (see Box 7.9) and mothers and daughters reporting exactly the same dreams, even though they had not discussed these dreams with each other.

***Dreams may be genetically influenced.***

**Box 7.9** Dream reports of identical twins<sup>197</sup>

A pioneer of sleep research, Michel Jouvet, recalls discussing dreams with a young man. "When I was a child", said the young man, "I often had the same dream. I was walking by a large house where I could see a woman dressed in black opening a door to a large hallway." His twin brother, who resembled him in every way, arrived just at that moment. Catching the last words of the story, he spontaneously finished the sentence: "...and hundreds of cats came running out." His brother looked at him in amazement and said, "How do you know what happened in my dream? I've never told it to anyone else!"

## 7.15 Can things from the environment enter dreams during sleep?

You may have experienced dreaming about a phone ringing or an alarm going off – only to suddenly wake up and realise that the phone or alarm really is ringing. This is called "dream incorporation". Something external to the sleeper is brought into an ongoing dream. If water droplets fall on a sleeper's face, there may be reports of dreaming of rain. A sleeper who is cold may dream of being in snow country. Studies show that it is not always easy to make dream incorporation happen and it seems to be very hard to bring about in children, possibly because their sleep is so deep.

***On a hot night  
you may  
dream of a hot  
desert.***

## 7.16 Why are our vivid dreams so bizarre?

When vivid dreams occur the brain prefers making associations between things that are novel, not the usual waking connections. It wants to ignore the obvious links. When we are awake the front part of our brain controls how we process information, plan things and make sense of the world around us. These frontal areas shut down during our dreams and allow the brain to put together images and ideas that normally have only very

<sup>196</sup> From Hearne and Melbourne (1999) p. 55

weak associations. Perhaps it simply puts together things which are stored near each other in our memory banks. Perhaps images are organised in dreams by other factors,

***The organising part of our brain shuts down when we dream.***

such as their emotional similarity. All sorts of absurd things go together.

For example, in the dream reported earlier<sup>198</sup> one part reads:

As the tide comes in people are launching themselves into the waves but when the water recedes I see that all the people are lying in piles of rubbish and I think it can't have been water at all.

Somehow the brain has connected the waves with piles of rubbish – things that normally don't go together. In a dream we tolerate absurdities, and even crimes like murder can be seen as ordinary events in a dream. While we dream we believe that what is happening is right. We remain in blissful ignorance of how things should be, but our moral sense comes back to us as soon as we wake up. Sometimes our dreams can embarrass us as we think over them when awake.

### **7.17 Can dreams help solve problems?**

You may have heard someone say "I'll sleep on the problem". Because the brain is putting together things in an unusual way it can sometimes lead to creativity or problem solving. The structure of the benzene

***Dreams have led to inventions.***

molecule was said to come to a scientist in a dream. He was wrestling with the problem during his waking hours and couldn't work out how the atoms fitted together. The solution came to him as he dreamt of a group of snakes chasing each other, forming a circle with each snake holding the tail of another snake in its mouth. He woke up and realised that the snake pattern was how the atoms were attached to each other in the benzene ring.

<sup>197</sup> From Jouvett (1999)

<sup>198</sup> See Box 1.5 in Q1.11.

Several inventions are linked to people taking problems they are grappling with into their dream world. Two examples are the creation of the Periodic Table of Elements in chemistry and the invention of the lockstitch sewing machine. More recently, the invention of a voice smoke alarm for children happened because someone dreamt of a fire in his house and his children were told to wake up and evacuate by his own voice being played by the smoke alarm. He was going to just go back to sleep, but decided to write it down and then took out a patent, developed the idea and marketed it. Some poems and musical compositions are said to be dream inspired.

### 7.18 Why do some dreams happen repeatedly?

Repeated dreams must be the most commonly reported dream experience. It seems we all have recurring dreams that may be pleasant, unpleasant or neutral. However, we are most likely to remember really unpleasant dreams because of their emotional intensity and the much higher chance that they will wake us up. A study of the recurring dreams of university students found that the ones they remembered from childhood were more likely to have threatening characters, such as monsters and witches, than their more recent dreams. It seems these childhood recurring dreams relate more to topics from books, films and TV than the more unemotional dreams that children report when awoken in a dream study.<sup>199</sup>

***Recurring  
dreams  
may be  
about  
unresolved  
issues.***

The dream is created and recreated using the same neural connections in the brain, for reasons we don't yet understand. Freud would argue that these dreams relate to an unresolved conflict in our unconscious and that they may re-occur until the conflict is resolved, usually through the person gaining insight into the problem and successfully working it through. Similarly, Jung believed that recurring dreams relate to things we have not paid

enough attention to in waking life. Such ideas suggest that dreams might point to problems that have some importance to the dreamer. However, the fact that people can learn to control events in recurring bad dreams or nightmares in such a way that the dreams are changed and no longer frightening<sup>200</sup> argues against such an interpretation.

### 7.19 Why don't we always remember our dreams?

It seems that everyone has mental activity going on all night during sleep, and everyone has REM sleep, so technically everyone “dreams”.

However some people have a much richer dream world than others.

There seem to be three factors here. Firstly, there are clearly individual differences and some people can bring rich, powerful dreams from their sleep world into their waking world. Others find they can never recall a dream or only fragments of ones that are bland and unexciting. We know that females generally remember more dreams and report being more emotionally affected by dreams than males. Moreover, some people are believed to have little or no capacity for “imaging” in their mind while conscious or dreaming (see Box 7.9 to test yourself)

***Girls are often especially interested in dreams.***

Secondly, recalling dreams is helped by waking up. Scientists know that there is a chemical in the brain (norepinephrine) that is necessary for memory and attention. This chemical is not very active during sleep unless we wake up. Some people are quite likely to wake up immediately after a REM period, which is the time they are most likely to have vivid dreams. Some circumstances make it more likely that we wake up, like being anxious or stressed or needing to visit the bathroom during the night. Some people think that our dreams are just filed away somewhere

***Waking up is good for dream recall.***

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<sup>199</sup> see Q7.1 on changes in dreams as you age



in our brains for a day or so, rather than completely disappearing. This is because an experience the following day can sometimes bring a whole dream flooding back into our memory.

**Box 7.9** How good is your “imaging”.

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You can test how much capacity you have to create images in your mind (or mind’s eye). Imagine you are walking down your street and you see your unoccupied house suddenly burst into flames. The sharpness of the detail of the explosion (pictures, colour, sound, motion) in your imagination is an indicator of whether you have a *high*, *low* or *no* capacity for imaging. The better your imaging capacity, the more vivid your dreams are likely to be.

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The third factor is how keen you are to remember your dreams. If you are very motivated, put a pen and paper by your bedside to record dreams. As soon as you wake up keep your eyes closed and mentally go over your dreams in as much detail as possible to translate them from being dream activity to thoughts stored in your memory while you are awake. Then write them down as you lie in bed. How often you wake up during the night will be increased if you drink plenty of water before bed so you will need to visit the bathroom. Some say eating hot spicy foods will also stimulate vivid dreams.

Remembering your dreams can be fun and interesting and some people enjoy creating their own stories in lucid dreaming.<sup>201</sup> However, there is no evidence that remembering your dreams is important for anything.<sup>202</sup> In fact, there is an argument against remembering too many of your dreams

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<sup>200</sup> See Q7.22 on lucid dreaming and Case study 6.2 in Q6.6 about therapy for nightmares

<sup>201</sup> See Q7.22 about lucid dreaming

<sup>202</sup> Although writing down and working through nightmares can reduce their intensity (see Q6.6).

and that is that you may not remember if something happened in reality or if you dreamt it.

## 7.20 What about dreaming in animals?

It is common for people who live with pets to report that they seem to dream when asleep. This is especially the case for sleeping dogs and kittens, which can be seen to periodically have jerking legs, twitching ears and make whimpering sounds and even groans. We would like to wake them up and ask them what they were dreaming about. Obviously we can't do this, but in the 1950's a landmark experiment provided us with a window into the world of the dreaming cat. Earlier we saw that during REM sleep our muscles become paralysed,<sup>203</sup> preventing us from acting out our dreams. Scientists were able to stop this REM sleep muscle paralysis happening in a sleeping cat (by interfering with neurons in the cat's brain stem). At first the cat was sleeping soundly with its eyes closed, but it suddenly jumped up and began chasing an imaginary mouse, leaping to swipe at an invisible butterfly, bristle as if scared by a dog or lick itself intently. The brain recording showed that the cat was continuously asleep (in REM sleep), suggesting that it was acting out its dreams.

***Dogs and cats are active dreamers.***

We believe that almost all animals and birds have dreams because REM sleep has been consistently recorded in hundreds of species. The platypus seems to be one of the biggest dreamers, followed by the armadillo and opossum. However, REM sleep has been very hard to detect in dolphins, perhaps because their brain does not ever go completely to sleep. One half of a dolphin's brain sleeps at a time, with the other half remaining alert, probably because they cannot be fully asleep and breathe at the same time.

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<sup>203</sup> See Box 6.1 in Q6.8

## 7.21 Will dreams help the memory of schoolwork?

This issue has received a lot of investigation and is usually framed as whether REM sleep helps learning and memory. It has been researched by

- depriving people of REM sleep and then looking at their learning ability;
- studying possible memory problems in people taking medication that reduces their REM sleep;<sup>204</sup>
- seeing if a long or short time in REM sleep helps learning, and also,
- whether the different amounts of REM sleep in different animals relates to how easily they can learn new tasks.

From dozens of such studies the conclusion is that REM sleep does not play a major role in helping us learn and remember new things.

However, there is no doubt that a lack of sleep will interfere with both the ability to learn new material and also to recall information. Staying up most of the night to cram schoolwork means less concentration and memory skills while trying to learn the work and less concentration and memory skills during the exam the next day. Thus getting a good night's sleep before an exam is not important because of the REM sleep or dreaming that will happen, but because alertness improves mental functioning and sleepiness interferes with it.<sup>205</sup> Similarly, we can't absorb information while asleep.

***Staying up all night to study is bad for exam performance.***

## 7.22 Can the events in dreams be manipulated?

One of the major milestones in dream research happened in the 1970's when it was proven that some dreamers could manipulate the events within their dreams. Essentially, while a person is asleep and dreaming

<sup>204</sup> Sleeping tablets reduce REM sleep (see Q4.7)

<sup>205</sup> See Q1.7 for how sleepiness affects learning

they control what happens in the dream through thinking. This is called “lucid dreaming” (lucid=clear). One regular lucid dreamer reported: When I become aware that I am dreaming, I try to do silly things to see if I can make them happen, like flying and walking through walls. Once when I was 15, I even managed to beat up the school bully. There was a lot of satisfaction in that.<sup>206</sup>

Pioneers of lucid dreaming<sup>207</sup> note that there are different levels at which people can achieve lucid dreaming. With *slight* lucidity the person is aware they are dreaming for just a fleeting moment, before returning to a conventional dream. Sometimes this lasts longer and the person observes the dream in wonder, but takes no part in changing the dream. People with *good* lucidity become aware during the dream that they have full waking memory capacities and are also able to take an active part in the dream. They influence and even control the events in the dream, including creating unusual and exciting experiences like flying, changing their appearance, meeting interesting people or erotic encounters. Dreams can also be changed to learn new techniques (eg through dreaming of being part of a sports clinic with a famous person), talk to dead relatives, observe new art or music (which then can be copied in the waking hours). The possibilities are endless. People who can lucid dream note the startling reality of their dream experiences. The experiences are so convincing it seems as if another level of reality exists. Box 7.12 sets out how to train yourself to lucid dream.

<p><b><i>Lucid dreamers control their dreams.</i></b></p>
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<sup>206</sup> Quote from Hearne and Melbourne (1999) p 92.

<sup>207</sup> Keith Hearne and David Melbourne

**BOX 7.12** Training yourself to lucid dream<sup>208</sup>

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Success in learning to lucid dream at a high level depends on your determination and persistence, and to some extent, your individual aptitude for lucid dreaming.

Step 1: Keep a dream diary and write down as many of your dreams in detail as possible. This is training your subconscious and makes remembering dreams easier. Getting plenty of sleep makes this easier.

Step 2: When you have become good at remembering your dreams, set your alarm to wake you up an hour before your usual waking up time to maximise your chance of being awoken during a dream. Keep your eyes closed, even when turning off the alarm.

Step 3: Lie back and recall your dream. Imagine yourself back in the dream and re-enact the scenarios of the dream. (If possible, change what you were doing in the dream at this point.)

Step 4: Next you need to notice something impossible within the dream. This could be anything bizarre, such as noticing a change in the size or shape of something familiar to you (such as a part of your body), seeing something unusual such as a house made of paper or becoming aware that you are doing something unusual such as flying above the ground. At that point you realise that this is not reality so it must be a dream.

Step 5: At the moment you recognise that you are in a dream you can start to change what you were doing in the dream. It is important that prior to going to bed you set up in your mind what you want to do when lucid dreaming. For example, you may say to yourself while awake that when you become aware you are dreaming you want to try to walk through a solid object, or fly above your bed, or your house. Then when realise that you are dreaming, you can draw on this plan and, hopefully, change the events of your dream.

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<sup>208</sup> Adapted and abbreviated from Hearne and Melbourne (1999) pp 94-96. See also the internet sites at the end of this book.

## ***BIBLIOGRAPHY***

Ambrogetti A. (2000) *Sleeping soundly. Understanding and treating sleep disorders*. St Leonards, Australia: Allen and Unwin

Barnier AJ and Lack L (2001) Chapter 7. in NW Bond & KM McKonky (Eds). *Psychological science*, (pp 98-132) McGraw Hill.

Brighthope I. (1990) *Fighting fatigue and the Chronic Fatigue Syndrome*. Melbourne: McCulloch Publishing.

Broughton RJ (1994) Homicidal somnambulism: A case report. *Sleep* 17(3) 253-264.

Bruck D. & Pisani D. (1999). The effect of sleep inertia on decision making. *Journal of sleep research*, 8, 95-103.

Bruck D. (2001a) The who, what, where and why of waking to fire alarms: a review. *Journal of fire safety*, 36, 623-639.

Bruck D. (2001b). Achieving control over sleepiness in narcolepsy. *Australian journal of primary health interchange*, 7(1), 16-24.

Bruck D. (2001c). The impact of narcolepsy on psychological health and role behaviours: negative effects and comparisons with other illness groups. *Sleep medicine*, 2, 437-446.

Bruck D. and Costa A. (2003) The natural history of health and symptoms in narcolepsy: a 10 year longitudinal study. *Australian journal of primary health*, 9(1), 59-67.

- Bruck, D. & Broughton R. (2003) Diagnostic ambiguities in a case of post-traumatic narcolepsy. *Brain injury*, 18(3), 321-326.
- Buyse D.J., Reynolds CF, Monk TH, Birmans SR, & Kupfer DJ (1989) The Pittsburg Sleep Quality Index: A new instrument for psychiatric practice and research. *Psychiatry research*, 28, 193-213.
- Carskadon MA (ed.) (2001) *Adolescent sleep patterns: Biological, social and psychological influences*. Cambridge: Cambridge University Press.
- Cartwright RD (1996) Dreams and adaptation to divorce. In D Barrett (Ed). *Trauma and Dreams* (pp. 179 – 185). London: Harvard University Press.
- Chokroverty S. (1994) *Sleep disorders medicine: Basic science, technical considerations and clinical aspects*. Boston: Buterworth-Heinemann.
- Davies D. (1999) *The element guide to insomnia: Your questions answered*. Boston: Element.
- Davis A. (1992) *Let's get well*. Hammersmith, London: Thorsons.
- Dawson D & Reid K (1997) Fatigue, alcohol and performance impairment. *Nature*, 388(6639), 235.
- Dement WC, Hall J and Walsh J (2003) Tiredness versus sleepiness: semantics or a target for public education? *Sleep*, 26 (4), 485-486.
- Dijk DJ & Duffy JF (1999) Circadian regulation of human sleep and age related changes in its timing, consolidation and EEG characteristics. *Annals of medicine*, 31,130-140.

- Dotto L (1990) *Losing sleep: How your sleeping habits affect your life*. NY: Quill.
- Ferber R (1985) *Solve your child's sleep problems: The complete practical guide for parents*. NY: Penguin.
- Foulkes D (1982) *Children's dreams: Longitudinal studies*. NY: John Wiley and Sons Inc.
- Giannotti, F & Cortesi, F (2002) Sleep patterns and daytime function in Adolescence: An epidemiological survey of an Italian High School Sample. In MA Carskadon (Ed.) *Adolescent Sleep Patterns*. (pp. 132-147) Cambridge University Press, Cambridge.
- Hearne K & Melbourne D. (1999) *Understanding dreams*. London: New Holland.
- Hoddes E, Zarcone V, Smythe H, Phillips R, & Dement WC (1973) Quantification of sleepiness; a new approach. *Psychophysiology*, 10, 431-436.
- Hood B. (1997) Wake up to sleepy students. *Youth studies Australia*, 16(2), 16-19.
- Johns MW (1991). A new method for measuring daytime sleepiness: the Epworth Sleepiness Scale, *Sleep*, 14(6), 540-545.
- Jouvet M. (1999) translated by L. Garey. *The paradox of sleep: The story of dreaming*. Cambridge, MA: MIT press.



Kennedy GA (2002) A review of hypnosis in the treatment of parasomnias: Nightmare, sleepwalking, and sleep terror disorders. *Australian journal of clinical and experimental hypnosis*, 30(2), 99-155.

Kennedy G & Bruck D (2002) *Sleep disorders* NSW Central West Division of General Practice (GP Mental Health Supplement).

Klimas EB (2002) Chronic fatigue syndrome: probable pathogenesis and possible treatments. *Drugs* 62(17), 2433-46.

Lacrampe, C (2002) *Sleep and rest in animals*. Paris: L'Iconoclaste.

Lefton LA (1994) *Psychology* (5<sup>th</sup> ed.) Needham Heights, MA: Allyn and Bacon.

Mercer JD, Bootzin RD, & Lack LC (2002) Insomniac's perception of wake instead of sleep. *Sleep*, 25(5), 564-71.

Moore-Ede MC, Sulzmann FM and Fuller CA (1982) *The clocks that time us: Physiology of the circadian timing system*. Cambridge, MA: Harvard University Press.

Nacson Leon Website *Dream coach* retrieved on 3<sup>rd</sup> March, 2004 from <http://www.dreamcoach.com.au/>.

Proceedings of the 17<sup>th</sup> Annual Meeting of the American Professional Sleep Societies, Chicago, Illinois, 2003, *Sleep*, Volume 26.

*Purdue researchers discover basis for biological clock*. Retrieved on 7<sup>th</sup> January, 2003 from <http://www.sciencedaily.com/release/2003/01/030107073125.htm>

- Ratcliff, AJJ (1923) *A history of dreams*. London: Senate (Random House).
- Robbins PR & Tanck, RH (1991-1992) A comparison of recurrent dreams reported from childhood and recent recurrent dreams. *Imagination, cognition and personality*, 11(3), 259-262.
- Roenneberg T (2004) A marker for the end of adolescence. *Current biology*, 14 (24), R1038.
- Schaefer CE (Ed.) (1995) *Clinical handbook of sleep disorders for children*. Northvale, NJ: J.Aronson.
- Shapiro CM. (1993) *ABC of sleep disorders*. London: BMJ Publishing Group.
- Shneerson, J.M. (2000) *Handbook of sleep medicine*, Malden, MA: Blackwell Science Ltd.
- Siegel JM (2001) The REM sleep-memory consolidation hypothesis. *Science*, 294 (5544), 1058.
- Smith, C.S., Reilly, C. & Midkiff, K. (1989). Evaluation of three circadian rhythm questionnaires with suggestions for an improved measure of morningness. *Journal of applied psychology*, 14(5), 728-738.
- Stores G (2001) *A clinical guide to sleep disorders in children and adolescents*. Cambridge: Cambridge Univ Press.
- Szuba MP, Kloss JD, & Dinges DF (2003) *Insomnia: Principles and management*. NY: Cambridge University Press.

Tresniowski A, Benet L, Slania J, & Marr A (1999) Troubled sleep. *People*, 52(1), 56.

Webb WB & Campbell SS (1983) Relationships in sleep characteristics of identical and fraternal twins. *Archives of genetic psychiatry*, 40, 1093-1095.

Zadra A.L & Pihl R (1997) Lucid dreaming as a treatment for recurrent nightmares. *Psychotherapy psychosomatics*, 66, 50-55.

## ***USEFUL INTERNET SITES***

### **General Sleep Information**

#### **SleepNet**

<http://www.sleepnet.com/>

*“Since 1995 - Everything you wanted to know about sleep but were too tired to ask”*

Non-commercial educational site designed for the lay person. On-line forums for discussion of sleep disorders, information about various sleep disorders, on-line sleep test, tips for healthy sleep. Friendly, easy to navigate site.

#### **Talk About Sleep**

<http://www.talkaboutsleee.com/>

Our mission at Talk About Sleep (TAS) is to increase awareness of sleep and sleep disorders in the general public and within the medical professional communities, helping to identify and facilitate the management of these problems.

Interactive message board, regular on-line real-time chat forums with sleep experts.

#### **The Sleep Medicine Home Page**

<http://www.users.cloud9.net/~thorpy/>

Links site with a comprehensive, international listing of websites for sleep professionals and sleep disorder sufferers.

### **National Sleep Foundation**

<http://www.sleepfoundation.org/>

Site of the American National Sleep Foundation: an independent not-for-profit organisation dedicated to raising awareness of sleep disorders, their prevalence and treatment.

### **Think Quest: Sleep from A to Zzzz**

<http://library.thinkquest.org/25553/>

Excellent and informative site with information and links on all aspects of sleep. Approachable, easy to understand information. Can be viewed in English, French or Spanish

### **Brain Talk Communities**

[www.braintalk.org](http://www.braintalk.org)

Web community for people with neurological disorders and their partners/carers. Very active Narcolepsy group.

## **Sleep Apnoea**

### **Snorer.Com**

<http://www.snorer.com/snorer/>

Information site for snorers and their partners. Focus on sleep apnoea and medical treatment; contains Epworth Sleepiness Scale. Very informative site with printer friendly settings of documents.

### **Centre for Snoring and Sleep Disorders**

<http://www.snoring.com.au>

Run by an ENT/facial plastic surgeon. Active message board and information about surgical treatment for snoring and sleep apnoea.

## Dreams

### **Dream Coach**

<http://www.dreamcoach.com.au/>

Website of Leon Nacson, 'dream coach' and author of a number of books about dream interpretation. Site contains index of dream symbols, emotions and puns, an on-line dream diary, articles and FAQ.

### **The Dream Emporium**

<http://www.dreamemporium.com/>

Friendly, easy-to-navigate but text heavy site devoted to dream symbols, book reviews, interpretation and explanations of other sleep phenomena. Runs a monthly Dream Interpretation Contest.

### **Dreams 101**

<http://www.susanhendricks.com/>

Interpretation site with a focus upon Freudian and Jungian interpretation.

### **Association for the Study of Dreams**

<http://www.asdreams.org/>

Comprehensive website with e-study (chat) groups, dream art gallery, links to hundreds of articles from the ASD journal *Dreaming* and magazine *Dream Time*.

### **SlowWave**

<http://www.slowwave.com/>

Cute and funny site where readers can send in their dreams to be drawn up in comic-form by San Francisco artist Jesse Reklaw. A new dream-comic is uploaded every week.

### **A Conspiracy of Sleepers**

<http://www.birdhouse.org/dreams/>

Do you think your dreams are strange? Read other peoples dreams on this simple site, and submit your own.

### **The Lucidity Institute FAQ**

<http://www.lucidity.com/LucidDreamingFAQ2.html>

FAQ with lot of information about lucid dreams and how to induce them. Website of Stephen LaBerge, researcher and author of a number of books on Lucid Dreaming.

## **Nightmares and Night Terrors**

### **Kids Health Nightmares Page**

<http://kidshealth.org/kid/feeling/thought/nightmares.html>

Health information site for children providing simple information about sleep, dreams and nightmares. Bright, colourful and easy to navigate.

### **Night Terror Resource Center**

<http://www.nightterrors.org/>

Text-intensive website run by a night-terror sufferer. Lots of information and message boards.

## **Narcolepsy**

### **Center for Narcolepsy**

<http://www-med.stanford.edu/school/Psychiatry/narcolepsy/>

Website of Narcolepsy research group at Stanford Medical School. Focus on research- contains some short movies of cataleptic attacks in humans and experimental animals.

### **Living with Narcolepsy**

<http://expage.com/page/livingwithnarcolepsy>

Personal website of a young woman with narcolepsy. Friendly and informative site.

### **MSN Group: Living with Narcolepsy**

<http://groups.msn.com/LivingwithNarcolepsy/>

An online support group with a very active message board.

### **Dreaming Awake**

[http://news.mpr.org/features/199709/02\\_smiths\\_narcolepsy/index.shtml](http://news.mpr.org/features/199709/02_smiths_narcolepsy/index.shtml)

Transcripts, pictures and sound files from a program on Narcolepsy produced by Minnesota Public Radio.

## **Sleep Walking**

### **Diary of a Somnambulist**

<http://www.sleepwalkdiary.com/>

Personal site of a young woman who has been sleep walking since childhood. Diary of sleep walking episodes, chat room and links to other sleep-related sites.



## **Mental Health**

### **Teen Health Centre**

<http://www.teenhealthcentre.com/teens/mentalhealth/>

Links to comprehensive articles about depression, anxiety and panic, and some useful, practical tips on how to feel better.

### **Wings of Madness**

<http://www.wingofmadness.com/articles/teens.htm>

Mental health website with information and support for teenagers suffering from depression, including links to articles and support news-groups.

### **Trapped Minds**

<http://www.trappedminds.com/>

Support website devoted to depression. Extensive information and links related to depression in teenagers. Contains journals, chat room and many other opportunities to become part of a supportive community.

### **Guide for Teenagers with Depression**

<http://www.lorenbennett.org/youthguide.htm>

Guides for teenagers about depression, produced by the US Department of Health and Human Services and SAVE (Suicide Awareness Voices of Education)

### **Beyond Blue – the Australian National Depression Initiative**

<http://www.beyondblue.org.au/>

Information and link site- contains links to current research, basic information about depression and possible treatment. Online forums, links to online support organisations for teenagers.

## **Panic Attacks**

### **Panic Attacks, Anxiety Disorder & Phobias**

<http://www.npadnews.com/>

Run by the National Panic and Anxiety News (NPADNEWS) team, it is a comprehensive website with a lot of information and links to other panic/anxiety related websites.

### **Anxiety/Panic Attack Resource Site**

<http://www.anxietypanic.com/>

Similar to above, but looks prettier.

### **Panic-Anxiety Disorders Help and Support**

<http://panicdisorder.about.com/>

contains a lot of practical information about panic and anxiety, guides to commonly used medications, definitions of panic and anxiety, and reviews the recent literature about panic disorders. Contains a lot of advertisements.

### **Anxiety Network Panic Disorder Homepage**

<http://www.anxietynetwork.com/pdhome.html>

Website run by a psychologist which contains simple, useful accessible information (and no ads!)

### **Panic Disorders Institute**

<http://www.alqy.com/pdi/>

Another one run by a psychologist, contains more information than the previous one, has a discussion forum and a long and comprehensive FAQ section.

## **Relationships and Sexual Health**

### **Myogenic**

[www.mogenic.com](http://www.mogenic.com)

Myogenic is an online Australian Gay and Lesbian youth magazine providing support, information and friendship for young people under the age of 25. It contains a chat room, personals, an advice column and many stories written by Myogenic users about their experiences of being young and gay, lesbian, bisexual or transgender.

## APPENDICES

### Appendix A: Scale assessing level of morningness or eveningness<sup>209</sup>

Tick one answer only that best describes you most of the time.

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 am – 6.30 am	_____	(5)
6.30 am – 7.45 am	_____	(4)
7.45 am – 9.45 am	_____	(3)
9.45 am – 11.00 am	_____	(2)
11.00 am – 12.00 noon	_____	(1)

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

8.00 am – 9.00 am	_____	(5)
9.00 am – 10.15 am	_____	(4)
10.15 am – 12.30 am	_____	(3)
12.30 am – 1.45 am	_____	(2)
1.45 am – 3.00 am	_____	(1)

3. Assuming normal circumstance, how easy do you find getting up in the mornings?

Not at all easy	_____	(1)
Not very 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?

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

<sup>209</sup> From: Smith, Reilly, & Midkiff, (1989).

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

- |                  |       |     |
|------------------|-------|-----|
| 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 them is between 7.00am – 8.00am. 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 am – 9.00 am   | _____ | (5) |
| 9.00 am – 10.15 am  | _____ | (4) |
| 10.15 am – 12.30 am | _____ | (3) |
| 12.30 am – 1.45 am  | _____ | (2) |
| 1.45 am – 3.00 am   | _____ | (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 am – 10.00 am | _____ | (4) |
| 11.00 am – 1.00 pm | _____ | (3) |
| 3.00 pm – 5.00 pm  | _____ | (2) |
| 7.00 pm – 9.00 pm  | _____ | (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)
- Rather more a morning type \_\_\_\_\_ (3)
- than an evening type
- Rather more an evening type \_\_\_\_\_ (2)
- than a morning type
- 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 am \_\_\_\_\_ (4)
- 6.30 am – 7.30 am \_\_\_\_\_ (3)
- 7.30 am – 8.30 am \_\_\_\_\_ (2)
- 8.30 am or later \_\_\_\_\_ (1)

11. If you always had to rise at 6.00 am, what do you think it would be like?

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

12. How long 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 \_\_\_\_\_ (4)
- (morning alert & evening tired)
- To some extent, morning active \_\_\_\_\_ (3)
- To some extent, evening active \_\_\_\_\_ (2)
- Pronounced evening active \_\_\_\_\_ (1)
- (morning tired & evening alert)

**Scoring:** Add up the numbers in brackets beside your response and see which group you belong to:

Evening Type	22 and less
Intermediate Type	23-43
Morning Type	44 and above

## Appendix B: Sleep Quality Index<sup>210</sup>

The following questions relate to your usual sleep habits during the past month only. Your answers should indicate the most accurate reply for the majority of days and nights in the past month. Please answer all questions.

- During the past month, how long has it usually taken you to fall asleep each night?

Less than 15 minutes	_____ (0)
16-30 minutes	_____ (0.5)
31-60 minutes	_____ (1)
more than 60 minutes	_____ (1.5)

- During the past month, how many hours of actual sleep did you get at night? (This may be different from the number of hours you spent in bed.)

More than 7 hours	_____ (0)
6-7 hours	_____ (1)
5-6 hours	_____ (2)
less than 5 hours	_____ (3)

- During the past month, how many hours have you spent in bed per night trying to sleep but not actually asleep? (This includes being awake when you first try to go to sleep, waking up during the night and in the morning trying to get back to sleep.)

Less than 1 hour	_____ (0)
1-2 hours	_____ (1)
2-3 hours	_____ (2)
more than 3 hours	_____ (3)

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<sup>210</sup> Adapted from the Pittsburg Sleep Quality Index (Buysse, Reynolds, Monk, Berman, & Kupfer 1989).



- During the past month, how often have you had trouble sleeping because you cannot get to sleep within 30 minutes?

Not during the past month \_\_\_\_\_(0)  
Less than once a week \_\_\_\_\_(0.5)  
Once or twice a week \_\_\_\_\_(1)  
Three or more times a week \_\_\_\_\_(1.5)

- During the past month, how often have you had trouble sleeping because you wake up in the middle of the night or early morning?

Not during the past month \_\_\_\_\_(0)  
Less than once a week \_\_\_\_\_(0.1)  
Once or twice a week \_\_\_\_\_(0.2)  
Three or more times a week \_\_\_\_\_(0.4)

- During the past month, how often have you had trouble sleeping because you have to get up to use the bathroom?

Not during the past month \_\_\_\_\_(0)  
Less than once a week \_\_\_\_\_(0.1)  
Once or twice a week \_\_\_\_\_(0.2)  
Three or more times a week \_\_\_\_\_(0.3)

- During the past month, how often have you had trouble sleeping because you cannot breathe comfortably?

Not during the past month \_\_\_\_\_(0)  
Less than once a week \_\_\_\_\_(0.1)  
Once or twice a week \_\_\_\_\_(0.2)  
Three or more times a week \_\_\_\_\_(0.4)

- During the past month, how often have you had trouble sleeping because you cough or snore loudly?

Not during the past month \_\_\_\_\_(0)  
Less than once a week \_\_\_\_\_(0.1)  
Once or twice a week \_\_\_\_\_(0.2)  
Three or more times a week \_\_\_\_\_(0.3)

- During the past month, how often have you had trouble sleeping because you feel too cold?

Not during the past month \_\_\_\_\_(0)  
Less than once a week \_\_\_\_\_(0.1)  
Once or twice a week \_\_\_\_\_(0.2)  
Three or more times a week \_\_\_\_\_(0.3)

- During the past month, how often have you had trouble sleeping because you feel too hot?

Not during the past month \_\_\_\_\_(0)  
Less than once a week \_\_\_\_\_(0.1)  
Once or twice a week \_\_\_\_\_(0.2)  
Three or more times a week \_\_\_\_\_(0.3)

- During the past month, how often have you had trouble sleeping because you had bad dreams?

Not during the past month \_\_\_\_\_(0)  
Less than once a week \_\_\_\_\_(0.1)  
Once or twice a week \_\_\_\_\_(0.2)  
Three or more times a week \_\_\_\_\_(0.4)

- During the past month, how often have you had trouble sleeping because you have pain?

Not during the past month \_\_\_\_\_(0)  
Less than once a week \_\_\_\_\_(0.1)  
Once or twice a week \_\_\_\_\_(0.2)  
Three or more times a week \_\_\_\_\_(0.3)

- During the past month, how often have you had trouble sleeping because of another reason not mentioned?

Not during the past month \_\_\_\_\_(0)  
Less than once a week \_\_\_\_\_(0.1)  
Once or twice a week \_\_\_\_\_(0.2)  
Three or more times a week \_\_\_\_\_(0.3)

- During the past month, how would you rate your sleep quality overall?

Very good \_\_\_\_\_(0)  
Fairly good \_\_\_\_\_(1)  
Fairly bad \_\_\_\_\_(2)  
Very bad \_\_\_\_\_(3)

- During the past month, how often have you taken medicine to help you sleep (prescribed or “over the counter”)?

Not during the past month \_\_\_\_\_(0)  
Less than once a week \_\_\_\_\_(1)  
Once or twice a week \_\_\_\_\_(2)  
Three or more times a week \_\_\_\_\_(3)

- During the past month, how often have you had trouble staying awake while driving, eating meals, or engaging in social activity?

Not during the past month \_\_\_\_\_(0)

Less than once a week \_\_\_\_\_(0.5)

Once or twice a week \_\_\_\_\_(1)

Three or more times a week \_\_\_\_\_(1.5)

- During the past month, how much of a problem has it been for you to keep up enough enthusiasm to get things done?

No problem at all \_\_\_\_\_(0)

Only a slight problem \_\_\_\_\_(0.5)

Somewhat of a problem \_\_\_\_\_(1)

A very big problem \_\_\_\_\_(1.5)

**Scoring: Add up all the numbers (note some are decimals) in brackets. The maximum possible score is 21. A score of 5 or more suggests that you are a poor sleeper.**

## Appendix C: Muscle relaxation

*(With thanks to Dr Gerard Kennedy, Victoria University, Melbourne- used with permission)*

*Find a way of recording the script below onto a CD or cassette tape so you can play it to yourself when you are trying to go to sleep. Many computers allow the recording of sounds into a file that can then be copied on to a CD. Ask a parent or friend to record it for you or you record it while they relax. It's a bit easier to pace yourself slowly through the script if someone is trying to relax as you read it out and record it. The whole sequence should take at least 20 minutes. Going slowly is best.*

*See Box 5.1 in Q5.1 for a short description of a similar muscle relaxation sequence.*

***The voice must be very soft and calm, very flat, even boring.***

---

- You are lying comfortably.
- You are relaxing yourself.
- You are aware of the sounds around you and sometimes thoughts may come into your head.
- You can just let the sounds go.
- Let the thoughts keep coming and then letting them go again.
- Gently push the sounds and any thoughts to one side, they are not important.
- Relax yourself.
- Slowly unwind.
- Close your eyes gently.
- All you are doing at the moment is focussing on your breathing in and breathing out.
- Feel yourself slowly breathing in and slowly breathing out.

For the next few moments just become aware of the **muscles in both your feet.**

- Imagine that every time you breathe out you are letting out a little bit of the tension or tightness that might be in the muscles of your feet.
- Letting a tiny amount of the tightness in your muscles go each time you breathe out.
- Gradually relaxing the muscles in both feet over a series of 10 to 12 breathes out.
- Letting tension go breath by breath, gradually relaxing all the muscles in both your feet.
- You relax your feet more and more deeply each time you breathe out.
- Say the word “relax” to yourself and release a little bit of the tension or tightness in both feet.
- No need to try to relax all the muscles at once, just try relaxing them gradually with 10 or more breaths.
- Remember to say the word “relax” to yourself, each time you breathe out.
- Relax the tension in your feet.
- You are feeling more and more calm.
- Relaxing the muscles more and more deeply with every single breath you breathe out.
- Sinking deeper and deeper into a calm, peaceful and relaxed state.
- All you are doing is relaxing the muscles in your feet little by little with each breath you take out.
- Remember to say the word “relax” to yourself, each time you breathe out.
- If the muscles are a bit tense you can tighten that muscle and relax the tension as you breathe out.
- Sometimes you might have to repeat the process of tensing and letting go gradually in order to relax very stubborn types of muscles.

Now become aware of the **muscles in the lower part of both your legs – from the knees right down to your ankles - relax your calves.**

- Letting a tiny amount of the tightness in your muscles go each time you breathe out.
- Gradually relaxing the muscles in the lower part of both legs over a series of 10 to 12 breathes out.
- Letting tension go breath by breath, gradually relaxing all the muscles in both calves.
- Imagine that every time you breathe out you are letting out a little bit of the tension or tightness that might be in the calves of your legs.
- You relax them more and more deeply each time you breathe out.
- Say the word “relax” to yourself and release a little bit of the tension or tightness.
- No need to try to relax all the muscles at once, just try relaxing them gradually
- Remember to say the word “relax” to yourself, each time you breathe out.
- Relax the tension.
- You are feeling more and more calm.
- Relaxing the muscles more and more deeply with every single breath you breathe out.
- Sinking deeper and deeper into a calm, peaceful and tranquil state.
- You are just relaxing the muscles in your calves little by little with each breath you take out.
- Sinking more and more deeply into a calm feeling.
- Breath by breath entering a peaceful state.
- Relax as you let the tension in your calves go.
- Remember to say the word “relax” to yourself, each time you breathe out.
- You can even move your lips as you say the word “relax” to yourself.

Now focus your attention on the **top part of both legs**. Your feet are relaxed, your calves are relaxed, now let the tension go, bit by bit, from the top part of your legs.

- Imagine that every time you breathe out you are letting out a little bit of the tension or tightness that might be in the muscles of the top of the legs.
- Letting a tiny amount of the tightness in your muscles go each time you breathe out.
- Gradually relaxing the muscles in the top part of your legs as you breathe out.
- Letting tension go breath by breath, gradually relaxing all the muscles in the top of your legs.
- You relax your muscles more and more deeply each time you breathe out.
- Say the word “relax” to yourself and release a little bit of the tension or tightness.
- Just try relaxing those muscles gradually.
- Sinking deeper and deeper into a calmer state.
- Letting the tension go bit by bit.
- With each breathe out you feel more peaceful and tranquil.
- Remember to say the word “relax” to yourself, each time you breathe out.
- Relax the tension in the top of your legs.
- You are feeling more and more calm.
- Relaxing the muscles more and more deeply with every single breath you breathe out.
- Sinking deeper and deeper into a calm, peaceful and relaxed state.
- All you are doing is relaxing the muscles in the top of your legs little by little with each breath you take out.
- Remember to say the word “relax” to yourself, each time you breathe out.
- Focus your attention on slowly letting that tension go.



Now relax the muscles in the **lower part of your back**.

- Say the word “relax” to yourself and release a little bit of the tension or tightness.
- No need to try to relax all the muscles at once, just try relaxing them gradually.
- Remember to say the word “relax” to yourself, each time you breathe out.
- Relax the tension in the lower part of your back.
- Letting a small amount of the tightness in your muscles go each time you breathe out.
- Gradually relaxing the muscles in the lower part of your back over a series of breathes out.
- Imagine that every time you breathe out you are letting a little bit of the tension or tightness that might be in your lower back be released as you breathe out.
- Letting tension go breath by breath, gradually relaxing the muscles
- You relax them more and more deeply each time you breathe out.
- Sinking more and more deeply into a calm feeling.
- Breath by breath entering a peaceful state.
- Relax as you let the tension in your lower back go.
- Remember to say the word “relax” to yourself, each time you breathe out.
- You are feeling more and more calm.
- You are just relaxing the muscles in your lower back little by little with each breath you take out.
- Relaxing the muscles more and more deeply with every single breath you breathe out.
- Sink more and more deeply into a calm, peaceful and tranquil state.
- You are more and more relaxed with each breath.
- You are aware of your surroundings but gently focus on letting the tension go.
- All you are doing is breathing and relaxing those muscles.

Now feel those muscles around your **shoulder blades and the upper part of your back.**

- Letting a bit of the tightness in your muscles go each time you breathe out.
- Gradually relaxing the muscles in the upper back over a series of 10 to 12 breathes out.
- Letting tension go breath by breath, gradually relaxing all the muscles.
- You relax those muscles more and more deeply each time you breathe out.
- Say the word “relax” to yourself and release a little bit of the tension or tightness.
- No need to try to relax all the muscles at once, just try relaxing them gradually
- Remember to say the word “relax” to yourself, each time you breathe out.
- Sinking deeper and deeper into a calm and peaceful state.
- You are just relaxing the muscles in your upper back little by little with each breath you take out.
- Sinking more and more deeply into a calm feeling.
- Breath by breath entering a peaceful state.
- Relax as you let the tension go.
- Remember to say the word “relax” to yourself, each time you breathe out.
- Your lips move gently as you say the word “relax” to yourself.
- Relax the tension.
- You are feeling more and more calm.
- Relaxing the muscles more and more deeply with every single breath you breathe out.

Now think about the **muscles across your stomach area.**

- Relax those tummy muscles.
- Imagine that every time you breathe out you are letting a little bit of the tension or tightness that might be in the tummy muscles be released as you breathe out.
- Letting some of the tightness in your muscles go each time you breathe out.
- Gradually relaxing the muscles across the tummy area as you breathe out.
- Letting tension go breath by breath, gradually relaxing all those muscles.
- You relax your muscles more and more deeply each time you breathe out.
- Say the word “relax” to yourself and release a little bit of the tension or tightness in your tummy.
- You are relaxing those muscles gradually.
- Sinking deeper and deeper into a calmer state.
- Letting the tension go bit by bit.
- With each breathe out you feel more peaceful and tranquil.
- Remember to say the word “relax” to yourself, each time you breathe out.
- Relax the tension in the tummy area.
- You are feeling more and more calm.
- Relaxing the muscles more and more deeply with every single breath you breathe out.
- Sinking deeper and deeper into a calm, peaceful and relaxed state.
- You are relaxing the muscles little by little with each breath you take out.
- Remember to say the word “relax” to yourself, each time you breathe out.
- Focus your attention on slowly letting that tension go.
- You are relaxing those muscles bit by bit.

- You don't have to do anything else but relax and breathe slowly.

Focus on the tightness in your **chest area**.

- Letting tension go breath by breath, gradually relaxing all the muscles in your chest.
- You relax your muscles more and more deeply each time you breathe out.
- Say the word "relax" to yourself and release a little bit of the tension or tightness.
- Relaxing those chest muscles gradually.
- Sinking deeper and deeper into a calmer state.
- Relaxing the muscles more and more deeply with every breath you breathe out.
- Sinking deeper and deeper into a calm, peaceful and relaxed state.
- All you are doing is relaxing the muscles in your chest little by little with each breath you take out.
- Remember to say the word "relax" to yourself, each time you breathe out.
- Focus your attention on slowly letting that tension go.
- Imagine that every time you breathe out you are letting some of the tightness that might be in the muscles of the chest be released.
- Letting a small amount of the tightness in your muscles go each time you breathe out.
- Gradually relaxing the muscles in the chest as you breathe out.
- Letting the tension go bit by bit.
- With each breathe out you feel more calm, more peaceful.
- Remember to say the word "relax" to yourself, each time you breathe out.
- Relax the tension in the chest.
- You are feeling calmer and calmer.

For the next few moments just become aware of the muscles in **both your hands** – your wrist, your palms and your fingers.

- Imagine that every time you breathe out you are letting a little bit of the tension or tightness that might be in the muscles of the hands be released
- Letting a tiny amount of the tightness in your muscles go each time you breathe out.
- Gradually relaxing the muscles in both hands over a series of breathes out.
- Letting tension go breath by breath, gradually relaxing all the muscles in both your hands.
- You relax your hands more and more deeply each time you breathe out.
- Say the word “Relax” to yourself and release a little bit of the tension or tightness in both hands.
- No need to try to relax all the muscles at once, just try relaxing them gradually as you breathe.
- Remember to say the word “relax” to yourself, each time you breathe out.
- Relax the tension in your hands...
- You are feeling more and more calm.
- Relaxing the muscles more and more deeply with every single breath you breathe out.
- Sinking deeper and deeper into a calm, peaceful and relaxed state.
- All you are doing is relaxing the muscles in your hands little by little with each breath you take out.
- Remember to say the word “relax” to yourself, each time you breathe out.

Now become aware of the **muscles in your forearms** – from your elbows to your wrists.

- Letting a tiny amount of the tightness in your muscles go each time you breathe out.
- Gradually relaxing the muscles in the forearms as you breathe in and slowly out.
- Letting tension go breath by breath, gradually relaxing all the muscles in both forearms.
- Imagine that every time you breathe out you are letting a little bit of the tension or tightness be released.
- You relax them more and more deeply each time you breathe out.
- Say the word “relax” to yourself and release a little bit of the tension or tightness.
- Relax the tension.
- You are feeling more and more calm.
- Relaxing the muscles more and more deeply with every single breath you breathe out.
- Sinking deeper and deeper into a calm, peaceful and tranquil state.
- You are just relaxing the muscles in your forearms little by little with each breath you take out.
- Sinking more and more deeply into a calm feeling.
- Breath by breath entering a peaceful state.
- Remember to say the word “relax” to yourself, each time you breathe out.
- Relax as you let the tension in your forearms go.

Now focus your attention on the **top part of both arms**. Most of your body is now relaxed but now let the tension go, bit by bit, from the top part of your arms.

- Imagine that as you breathe out you are letting out a little bit of the tension or tightness that might be in those muscles.

- Letting a tiny amount of the tightness in your muscles go each time you breathe out.
- Gradually relaxing the muscles in the top part of your arms.
- Letting tension go breath by breath, gradually relaxing all the muscles in the top of your arms.
- You relax your muscles more and more deeply all the time.
- Say the word “relax” to yourself and release a little bit of the tension or tightness.
- Just try relaxing those muscles gradually.
- Sinking deeper and deeper into a calmer state.
- Letting the tension go bit by bit.
- With each breathe out you feel more peaceful and tranquil.
- Remember to say the word “relax” to yourself, each time you breathe out.
- Relax the tension in the top of your arms.
- You are feeling more and more calm.
- Relaxing the muscles more and more deeply with every single breath
- Sinking deeper and deeper into a calm, peaceful and relaxed state.
- All you are doing is relaxing the muscles in the top of your arms little by little with each breath you take out.
- Remember to say the word “relax” to yourself.
- Focus your attention on slowly letting that tension go.

Now relax the muscles in round your **neck and across your chin and jaw.**

- Say the word “relax” to yourself and release a little bit of the tension or tightness.
- No need to try to relax all the muscles at once, just try relaxing them gradually.
- Remember to say the word “relax” to yourself, each time you breathe out.

- Relax the tension in neck, the chin and the jaw.
- Letting a small amount of the tightness in your muscles go each time you breathe out.
- Gradually relaxing the muscles in the area over a series of breathes.
- Letting tension go breath by breath, gradually relaxing the muscles
- You relax them more and more deeply each time you breathe out.
- Sinking more and more deeply into a calm feeling.
- Breath by breath entering a peaceful state.
- Relax as you let the tension in your neck, your chin and your jaw go.
- Remember to say the word “relax” to yourself, each time you breathe out.
- You are feeling more and more calm.
- More and more peaceful.
- You are just relaxing the muscles little by little with each breath you take out.
- Relaxing the muscles more and more deeply with every single breath
- Sink more and more deeply into a calm, peaceful and tranquil state.
- You are more and more relaxed
- You are aware of your surroundings but gently focus on letting the tension go.
- All you are doing is breathing and relaxing those muscles.

Now feel those muscles around your **face**. **Think about your mouth, eyes and across the forehead.**

- Letting a bit of the tightness in your muscles go each time you breathe out.
- Gradually relaxing the muscles in the face.
- Remember to say the word “relax” to yourself, each time you breathe out.



- Letting tension go breath by breath, gradually relaxing all the muscles.
- You relax those muscles more and more deeply each time you breathe.
- Say the word “relax” to yourself and release a little bit of the tension or tightness.
- No need to try to relax all the muscles at once, just try relaxing them gradually
- Remember to say the word “relax” to yourself, each time you breathe out.
- Sinking deeper and deeper into a calm and peaceful state.
- You are just relaxing the muscles in your face little by little with each breath you take out.
- Sinking more and more deeply into a calm feeling.
- Breath by breath entering a peaceful state.
- Relax as you let the tension go.
- Your lips move gently as you say the word “relax” to yourself.
- Relax the tension.
- You are feeling more and more calm.
- Relaxing the muscles more and more deeply with every single breath you breathe out.

Now think of your **whole body**.

- Let the tension go with every breath in and every breath out.
  - Feel yourself slowly sinking into a very calm, very tranquil state.
  - Deeper and deeper.
  - Into a very peaceful state.
1. Letting yourself drift deeper and deeper.
  2. Further into a very deep, calm and relaxed state.

## Appendix D: Sleep Diary

(for an example of a complete diary see Q3.8, Box 3.1 in Chapter 3)

EACH MORNING DO THE FOLLOWING:

1. Write in yesterday's day and date.
2. With an arrow pointing down, mark the time you got into bed last night.
3. With a plain line, mark the time you think you fell asleep last night. Block out when you were asleep.
4. Mark whenever you woke up and fell back asleep during the night by leaving the space blank.
5. End the block at the time you finally awoke this morning.
6. With an arrow pointing up, mark the time you got out of bed this morning.
7. If you took any naps mark when they began and ended by blocking out the time.

	DAY	DATE	8PM	9PM	10PM	11PM	MID-NIGHT	1AM	2AM	3AM	4AM	5AM	6AM	7AM	8AM	9AM	10AM	11AM	NOON	1PM	2PM	3PM	4PM	5PM	6PM	7PM	8PM	
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