

Doctor, my child won't sleep. How can you help?

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Abstract

Sleep is a basic human function and is essential in allowing the body to recuperate. Chronic sleep deprivation can adversely affect cognitive functioning, memory and attention. It is estimated that 25–40% of children under 5 years, and up to 80% of children with neurodevelopmental disorders, have disrupted sleep. It is important to recognise this to prevent adverse effects on their health.

The aetiology of sleep disturbance in children is complex. The first line approach to sleep management should be to incorporate and implement good sleep hygiene through parental education. If sleep continues to be a problem, then pharmacological options may be used in conjunction with sleep hygiene. Melatonin is commonly prescribed despite not being licensed for the paediatric population. We review the use of melatonin and provide practical advice on prescribing regimes as well as advice on history taking and sleep hygiene management.

Keywords melatonin; sleep; sleep dyssomnia; sleep hygiene

How common are sleep difficulties?

Sleep difficulties in children affect many families. It has been estimated that between 25 and 40% of children under the age of 5 years have some degree of sleep difficulty. The modern expectation is that children should 'sleep through' from a very early age. However, sleep patterns are different in young children and continue to change until adulthood. Concerns arise as the child matures but their sleep pattern does not appear to improve.

The 24-hour culture has also impacted on the quality of sleep especially with the popularity of electronic devices such as smart phones and tablets. These electronic screens can delay the onset of sleep significantly due to the wavelength of light emitted,

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inhibiting natural melatonin production. Popular strategies such as controlled crying or camping out exist and some individuals feel these methods offer success whilst others find them unpalatable. The most important intervention in managing sleep difficulties is instilling good sleep hygiene for the entire family. Without this, other interventions such as pharmacology are unlikely to be effective.

Why is sleep important?

Chronic sleep deprivation can lead to a decrease in cognitive functioning. It also adversely affects memory and attention. Sleep is a critical time for growth and development. Poor or inadequate sleep can also negatively affect behaviour. Poor sleep can also lead to problems with irritability and mood swings, further impacting family life. The negative effects of poor sleep can last until later in life. Poor sleep in children impacts the entire family and can lead to parental depression and marital breakdown. Sufficient, good quality sleep is perceived to be important for a good quality of life. A link with obesity and poor sleep has also been made.

What is sleep?

There are two types of sleep which make up the sleep cycle.

Non REM – This is divided into four further stages and sleep becomes sequentially deeper with each. Stage one is the lightest as it is just when people have fallen asleep. By the time a person gets to stage four, they are in a deep sleep and will not wake easily. Most of the deep sleep occurs at the beginning of the night. There is hardly any psychological activity during this phase.

REM – It is during this phase that the eyes move rapidly. Although the brain is psychologically active and dreaming, the body's muscles are, in fact, atonic. The metabolic rate is also noted to be higher. The REM phase becomes longer with each sleep cycle.

As the night progresses, the body cycles through the above stages and therefore goes through a period of light sleep more than once. It is during these transitions that children can wake fully. Parasomnias, such as night terrors and sleep walking, may also occur. This affects adults to a lesser degree. An entire sleep cycle will vary in length depending on the age of the child. Generally, as the child ages, their sleep cycle will also lengthen. By 8 months it is about 50 minutes long and by preschool age the cycle has generally reached the adult length of about 1 ½ hours long.

A neonate starts their sleep cycle in the REM phase (also known as active sleep) and progresses to non REM later. The majority of their sleeping time is spent in REM. It is only as infants mature during their first year that the sleep cycles start with non REM and the proportion of REM sleep begins to reduce.

Children of different ages require varying amounts of sleep in a 24-hour period, including daytime naps. Between the ages of 1–3 years, an average of 12–14 hours is expected to be necessary. By 3–5 years it has reduced slightly to 11–12 hours. The need for a daytime nap by this age has also greatly reduced.

Beyond this age group, the total amount of sleep decreases further to an average of 10–11 hours.

Different sleep problems in childhood

For this article, we are concentrating on the difficulties children have with falling and staying asleep. This is known as dyssomnia. Parasomnias such as night terrors, sleep walking and nightmares and sleep conditions such as narcolepsy are not covered. It is always important to consider whether the perceived difficulties with sleep are purely due to learnt behaviours and lack of a robust routine or whether there is an underlying associated comorbidity such as obstructive sleep apnoea or seizures.

Adolescents can also struggle with sleep. Increased pressures in academic and social life compounded by the increasing use of electronic devices increase their difficulties in getting enough good quality sleep. Caffeine consumption from a range of sources (e.g. tea, coffee, fizzy drinks) may also be contributory. The natural secretion of melatonin is delayed until a later hour in adolescents compared to younger children. This affects their natural bedtime considerably. The total amount of sleep required by adolescents is similar to prepubescent children but because their sleep is physiologically delayed, they are also often sleep deprived.

Specific sleep difficulties in neurodevelopmental conditions

Significant sleep problems have a higher prevalence in children with neurodevelopmental disorders such as Autism and ADHD. Up to 80% of children with neurodevelopmental disorders have disrupted sleep. They seem to need less sleep than other children their age and therefore do not appear to be tired the next day. This has a great impact on their family who are often very keen for their child to sleep better so that everyone at home can benefit from improved health and wellbeing. The underlying mechanisms for sleep problems vary and the aetiology is known to be multifactorial.

In Autism Spectrum Disorder (ASD) there are problems with melatonin production and regulation. Some studies have also demonstrated a change in the sleep architecture of REM sleep. Insomnia is 10 times more frequent in children with ASD and these difficulties can persist into adulthood.

Improving children's sleep is felt to have a positive impact on their behaviour and can therefore improve ADHD symptoms. A potential cause of associated sleep difficulties in ADHD is the prescription of stimulant medication. It is also suggested that there is a delay in the secretion of melatonin in children with ADHD which postpones their natural sleep time. It has been proposed that the hyperactivity symptoms that affect their daytime behaviour can also affect them at night, leading to more movement at night, and subsequently poor sleep.

Assessment of sleep difficulties

Firstly, a detailed medical history is required to discover what the specific problem is and what has been tried so far. This history should also cover differentials for night time disturbances or waking such as seizure activity, parasomnias, obstructive sleep apnoea, obesity and depression. One must be mindful of an

underlying medical cause that may need further investigation and a different management approach. **Box 1** demonstrates areas that should be covered.

To supplement the information gathered during detailed history taking, it is useful to use a sleep diary. This should be completed contemporaneously by parents over a fortnight. This will give further insight into what is happening in the lead up to bedtime, what sleep routine is practised, whether the bedtime is consistent, how long it takes to fall asleep and the number and length of night time wake ups. The completed diary can be used to produce personalised advice regarding the routine as well as being useful in assessing whether pharmacological management would be beneficial. It does require the engagement of the family and accurate completion at a time when they themselves are sleep deprived.

Management of the sleep difficulties

Once the specific issues with the child's sleep pattern are identified, strategies to improve this must be initiated. Parent education is vital. Workshops and advice can be accessed through several sources including: GP, Health Visitor, Family Support Workers via Children's Centres, School Nurse or by a Paediatrician. It is important to be aware of local support groups and national organisations such as Cerebra.

Instilling good sleep hygiene is one of the most important steps in the first-line management of dyssomnia. Sleep hygiene is a collection of principles and practices that are applied to establish a good sleep routine. It is this consistent approach

Important questions to ask during the history

It is important to note in the history:

- Is the child meeting all developmental milestones?
- Are there concerns with the child's behaviour?
- How often is there a problem with sleep?
- What is the bedtime routine? Does it vary?
- What time does the routine start?
- What is the aimed for sleep time (consider if this is likely to be too early or late for the child)?
- What time do they fall asleep?
- What time do they wake up in the morning?
- Do they nap? When and for how long?
- Ask about screen time. How long before sleep are the devices turned off?
- Do they fall asleep alone or with someone with them?
- Where do they fall asleep? Why?
- Is the room dark, quiet and free from distraction?
- Do they share a bedroom?
- What do they eat or drink before bed?
- Does the child appear to be sleepy during the day?
- Is the child under pressure or stress from school or relationships?
- Does the child snore or demonstrate pauses in their breathing? Do they gasp for breath?
- Have any abnormal movements been noticed whilst the child sleeps?
- What have they tried so far?

Box 1

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