



CENTRE FOR  
Community  
Child Health

# Settling and Sleep Problems

*Practice Resource*

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# Practice Resource: Settling and Sleep Problems

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## Introduction

There is now a large amount of research evidence about the importance of the early years. Many professionals are unsure about how this evidence impacts on the services they provide for families and their professional practice.

The Centre for Community Child Health has therefore developed eleven "*Practice Resources*". Each *Practice Resource* provides professionals with:

- an introduction to the topic
- a summary of the latest research, and
- practical strategies to support their daily work with young children and their families.

These *Practice Resources* will help professionals consider and understand the issues and the range of researched options and strategies available to discuss with parents and carers in addressing their concerns and increasing their confidence. They will also support management to make sensible decisions about the use of resources and directions for services to address important issues for children.

The project to develop these eleven *Practice Resources* has been made possible through funding from the Telstra Foundation.

See Appendix 1 and 2 for more details about the Centre for Community Child Health and the Telstra Foundation respectively.

## Why were *Practice Resources* developed?

The *Practice Resources* have been designed to bridge the gap between research and practice. Most professionals do not have the time to sift through and interpret the relevant research that can inform how they work with children and families, nor do they have access or opportunity to attend relevant professional development.

The aim of the *Practice Resources* is to broadly translate the research evidence on a number of important topics into easily understood practical information that can be readily used by a range of professionals, assisting their daily work with young children and their families.

While each resource is written for professionals working with children and families, the information will also be useful to managers of services.

## What is the structure of each Practice Resource?

These resources are designed to be easy to use and inform professional practice. The structure of the *Practice Resources* enables access to information at different levels of detail depending on the user's needs.

Each resource has the following structure:

- **Glossary**  
Definitions of key terms.
- **Section 1: Introduction**  
This includes definitions, how frequently problems occur, information about normal development (where relevant), effects of the problem, and whether the focus should be on promotion, prevention, or early intervention.
- **Section 2: What works?**  
This includes a simple summary of the research and outlines what works and therefore the strategies that should be implemented. Whilst this section is brief, strategies are sufficiently detailed and specific for action. To support the professional there is also:
  - **Parent information:** Pointers to existing web based parent information are provided. This information has been reviewed to ensure the messages are consistent with those in the resource.
  - **Key messages:** A single page summary is provided outlining the most important messages for professionals and managers.
- **Section 3: What the research shows**  
Annotated summary tables of the research evidence and intervention studies is included, with information provided about the level of evidence, see Appendix 4. Also included are the more detailed key research principles that are fully referenced.
- **References**  
All references used to inform the resource are listed.

To make these *Practice Resources* easy for professionals to access and use, references are not included within “*Section 1: Introduction*” and “*Section 2: What Works*”. In “*Section 3: What the research shows*” references are included in the text. A full list of the references relevant to each topic can be found separately in the References section.

# Overview

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## What topics are covered?

### Promotion

- Breastfeeding
- Literacy

### Prevention

- Injury
- Overweight and obesity
- Smoking during pregnancy
- Passive smoking effects on children
- Child and adolescent smoking

### Early Intervention

- Language
- Settling and sleep
- Behaviour
- Eating behaviour

## How were the topics selected?

A number of criteria were used to select topics. These included:

- The importance of the issue in relation to children's health and development
- Requests from professionals
- Expression of need from communities
- Parental needs and concerns
- Perceived gap between evidence and practice
- Ease of including in daily professional practice
- Lack of information from other sources

See Appendix 3 for more detail about the selection criteria.

# Overview

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## How were the Practice Resources developed?

The content of the resources were drawn from the published research, expert advice, and information about innovative and promising practices. An expert committee oversaw the development of the content, and an expert in the field reviewed the content of each resource.

The format and design of the resources was focus tested and modified accordingly.

## Are there limitations to these Practice Resources?

For a number of topics there were limited numbers of well researched interventions and strategies available in the literature. Therefore it is important to note the following:

- Where possible National Health and Medical Research Council principles of assessing evidence were applied to research reviewed. For some topics there was very little evidence of high quality.
- Interventions and strategies included in the resources were based on a combination of research-based principles and expert advice.
- It is highly likely that the evidence for most topics will change over the next few years; suggested strategies may require ongoing review.

# Glossary

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<b>Active sleep</b>	Sleep involving head and muscle movements that is similar to the stage of sleep with rapid eye movements in adults.
<b>Behavioural interventions</b>	Specific strategies for addressing sleep problems that involve dealing with the child when awake, such as establishing an effective nightly routine or regulating the child's naps.
<b>Informational interventions</b>	Provision of information about ways to address settling or sleep problems
<b>Medical interventions</b>	Use of medication, either trimazepazine or niaprazine, to treat sleep problems.
<b>Mixed interventions</b>	Use of medication along with a behavioural strategy.
<b>Quiet sleep</b>	Sleep involving little or no movement, similar to the adult stage of non-rapid eye movement sleep.
<b>Self soothing</b>	Infant's ability to manage going to sleep and going back to sleep after waking without intervention.
<b>Sleep consolidation</b>	Period of sleep without waking from midnight to 5:00 a.m. or a continuous sleep episode without the need for intervention from the child's bedtime through to early morning.
<b>Settling problems</b>	Refusing to or taking a long time to settle, or tantrums at sleep times.
<b>Waking problems</b>	Waking frequently, waking for long periods, or both.

Refer to Appendix 5 for a glossary of terms related to research methodology terminology.

# Section 1: Introduction

## Setting the scene

Focus:	Early Intervention
Topic inclusion:	Night waking Problem settling
Age group:	Early childhood (6m - 4.5yrs)

Sleep, commonly defined as a state of decreased responsiveness and interaction with the environment, is necessary for the brain and body to develop. This is no doubt one reason that very young children spend so much time sleeping. However all the purposes of sleep are not known. Although sleep is thought of as a time to rest and recuperate, a lot of activity takes place in the body and the brain during sleep.

- **Sleep habits develop as a result of nature and nurture.**  
Sleep habits are learned, although they are based on biological needs and rhythms. These may be affected by a child's genetic makeup. Sleep habits change as the child develops. In order for children to get enough sleep, their daily routines need to match their requirements.
- **A child's sleep cycles and stages are similar in infancy and adulthood.**  
Sleep in the first year is made up of active and quiet sleep, similar to the adult stages of rapid eye movement and non-rapid eye movement sleep respectively. Active sleep involves head and muscle movements, while quiet sleep involves little or no movement.

**Sleep habits develop as a result of nature and nurture.**

**A child's sleep cycles and stages are similar in infancy and adulthood.**



# Section 1: Introduction

## Stages of typical development in settling and sleep

The stages of development in settling and sleep addressed are:

- Newborns (0 – 2 months)
- Infants (2 – 12 months)
- Toddlers (12 months to 3 years)
- Pre-school aged children (3 – 5 years)

### Newborns (0 – 2 months)

- Newborns sleep 16 – 20 hours in each 24 hour period, and premature infants may sleep more.
- Ninety five per cent of newborns wake every 3 – 4 hours at night in the first month and require an adult to help them go back to sleep.
- Bottle-fed infants sleep 3 – 5 hours at a time and breast-fed infants 2 – 3 hours.
- In the first few weeks sleep occurs throughout the day and night with no distinct pattern for each.
- Sleep is divided evenly between active and quiet sleep, with active sleep happening in the beginning of the sleep cycle between birth and three months, which may contribute to night waking.

#### *Developmental issues that may affect sleep*

- Sleep–wake cycles are largely dependent on whether the infant is hungry or full.
- Daily rhythms and environmental factors play a much smaller role in the sleep of newborns than in older infants.

# Section 1: Introduction

## Infants (2 – 12 months)

- Infants tend to sleep 9 – 12 hours at night and have 2 – 4.5 hours of daytime naps.
- They have between one and four naps, the number decreasing as they get older, with naps tending to last 30 minutes to two hours.
- In the early months in this period sleep tends to be 50 percent active and 50 per cent quiet.
- By three months sleep consists of six-hour cycles, two of which make up the night sleep period.
- At three months the amount of active sleep decreases and infants enter quiet sleep at the beginning of the sleep cycle.
- The sleep cycle consists of alternating active and quiet sleep periods of 20 – 50 minutes each (as compared with adults' 90 minute periods).
- By six months the infant's sleep patterns are closer to an adult's.
- By eight months infants wake every six to seven hours, and 60 – 70 per cent are able to get themselves back to sleep (self-soothe).

### *Developmental issues that may affect sleep*

- Attachment issues and social interactions play an important role in shaping sleep behaviours. In other words, the relationship with and interactions between the child and the caregiver impact greatly on both the quality and quantity of sleep.
- Increased mobility may temporarily disrupt sleep.
- Separation anxiety in 6 – 12 month olds may increase resistance to going to sleep and night waking.
- Object permanence refers to the infant's awareness that an object (such as a person) exists even when out of sight. Infants' sleep can be affected by this understanding. Upon waking during the night the infant becomes aware that persistent crying is likely to result in a response from a parent or carer.

# Section 1: Introduction

## Toddlers (12 months – 3 years)

- Toddlers are likely to sleep 12 – 13 hours in a 24 hour period.
- Naps are likely to decrease from two to one around the age of 18 months.
- Night waking may increase at around 12 months of age because of separation issues.
- Sleep cycles plus daytime sleep contribute to a more consistent night sleep cycle during this period.

### *Developmental issues that may affect sleep*

- Independent mobility may enable the child who wakes during the night to get out of bed and come to the parent or carer.
- Toddlers may have difficulty settling because of heightened awareness of what is going on and the strong desire to be active and independent.
- The child is able to respond to simple behavioural interventions as he or she is beginning to understand cause and effect.
- Understanding of the symbolic meaning of objects leads to increased interest in and reliance on comforting security toys and objects.
- Night-time fears may increase because of an increase in imagination and understanding.
- Limited ability to express oneself in language may interfere with communicating night-time fears.
- Separation anxiety peaks at 18 to 24 months.
- The child's behaviour may regress in stressful situations, leading to an increased wish to sleep with the parent(s) or carer(s).
- Being read to becomes an important part of the bedtime routine and also reinforces and develops literacy skills.

# Section 1: Introduction

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## Pre-school aged children (3 – 5 years)

- These children typically sleep 11 – 12 hours over a 24-hour period.
- Naps decrease from one to none.
- The pattern of active and quiet sleep approximates that of an adult by three years of age.

### *Developmental issues that may affect sleep*

- Increased language and cognitive skills may lead to increased bedtime resistance through testing limits.
- The child is increasingly able to be influenced by rewards and recognition for appropriate bedtime behaviour.
- Night-time fears may increase because of further development of imagination and exposure to fantasy.
- Being read to continues to be an important part of the bedtime routine as well as developing literacy skills.

# Section 1: Introduction

## When is settling or sleep a problem?

For children, the two most common sleep problems are night waking and settling problems:

1. Severe night waking has been defined as waking that occurs five or more times a week over three months and that includes one of the following:
  - waking three or more times a night
  - staying awake for more than 20 minutes after waking
  - going in to the parent's or carer's bed
2. A settling problem is defined as taking more than 20 minutes to settle on five or more nights a week over at least two months.

Sleep disorders are any difficulties related to sleeping, including:

- difficulty falling or staying asleep
- falling asleep at inappropriate times
- excessive total sleep time
- abnormal behaviours associated with sleep

**Regardless of whether a child meets clinical criteria for a sleep problem, parental concern about the child's sleep is viewed as a "good enough" reason for discussing their concerns with a professional.**

# Section 1: Introduction

## Summary of characteristics of typical sleep problems

### Infants under 12 months

- Inability to self-soothe
- Parents present until asleep
- Signalling to parent or carer by crying when awake
- Parent or carer choosing to respond to night waking and intervening leading to “night crier” learned behaviour
- Nightly variation in number of wakings
- Reliance on night feeds or dummies to resume sleep

### Toddlers 12 months to 3 years

- Parent present until asleep
- Naps too close to scheduled bedtime
- Transition from cot to bed
- Bedtime bottles and night feeding
- Inconsistent bedtime routines
- “Curtain calls” – after being settled, child frequently rises with a range of excuses for doing so

### Pre-schoolers 3 to 5 years

- No phasing out of daytime nap by four years
- Persistent co-sleeping with a parent or carer
- Inconsistent bed and wake time routines
- “Second wind” – late in the day a surge of alertness that can be exaggerated in some children and cause strong resistance to bedtime

## What are typical sleep issues with newborns (0 – 2 months)?

- Day-night reversal of sleep is common in first few weeks.
- Newborns typically have irregular sleep patterns.
- Smiling, grimacing, sucking, snuffling and body movements such as twists and jerks, all of which are typical of active sleep in infants, may be misinterpreted as restless or disturbed sleep by parents or carers.
- The absence of a consistent sleeping environment can interfere with sleep. Some newborns have difficulty if they are not in their own bed in their own room at bedtime, or if the lighting is not the same at bedtime as it will be through the night.
- Parents or carers sometimes have expectations about newborns’ sleep that are unrealistic.
- Medical issues, such as intolerance to cow’s milk protein or gastro-oesophageal reflux may cause the infant to be extremely fussy or always difficult to settle.

# Section 1: Introduction

## What are typical sleep issues with infants (2 – 12 months)?

- Difficulty falling asleep, frequent night waking with failure to self-settle, and daytime “cat napping” are typical in this age group.
- Some children have an inability to self soothe, that is, to drift off to sleep without having to be rocked or have a dummy.
- Signalling, that is, alerting parents or carers by crying rather than going back to sleep may become a pattern. Twenty to thirty per cent of one year olds are thought to be signallers.
- If infants are generally fed as part of the transition to bedtime then night feeding may become necessary for the infant to get back to sleep after waking at night. Breast-fed infants wake more frequently than those who are bottle fed.
- A parent’s or carer’s decision to respond immediately when an infant wakes, regardless of whether or not he or she signals, by soothing verbally, rocking or feeding can result in a ‘trained night crier’.

There is considerable variation in all the behaviours listed, but there is a clear link between regular difficulty self-soothing and frequent and problematic night waking.

## What are typical sleep issues with toddlers (12 – 36 months)?

- Sleep problems in toddlers are quite common and include the same problems that infants have, as well as night-time fears and nightmares.
- Toddlers who have sleep problems are more likely to have problem behaviours during the day.
- Having naps too close to bed time may interfere with going to sleep.
- Toddlers usually move from a cot to a bed between two and three years. If this happens at too early an age the likelihood of sleep problems increases. Problems can also be caused by ‘rules’ not being established first, for example that the child stays in bed until a parent or carer comes in.
- Bedtime bottles and night feeding can cause problems. Ideally the transition to sleep at bedtime should occur without a feed to promote settling without it and to prevent tooth decay.
- Having predictable daily rituals eases the transition to sleep by helping the child to relax.
- Objects such as blankets, soft toys, and dummies become very important in supporting independent settling and self-soothing.
- Some toddlers “stall” when bedtime is announced or when being put to bed, or get up repeatedly after being put to bed (curtain calls!).

# Section 1: Introduction

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## What are typical sleep issues with pre-school aged children (3 – 5 years)?

- Difficulties falling asleep and night waking are still common in this age group.
- The majority of children stop napping by the age of four years, although approximately 27 per cent still have naps at the age of five years.
- Persistent co-sleeping with a parent or carer tends to be strongly associated with sleep issues in this age group.
- Having a regular sleep schedule is important. If regular bedtime and wake time routines are not established, problems may develop.
- The second wind or “forbidden–zone” refers to the surge in alertness that occurs late in the day in children and adults. In some children it can bring with it intense activity and alertness which lead to resistance to going to bed around that time.
- Pre-school aged children may suffer from night terrors, which may involve the sudden onset of crying or screaming, thrashing around, seeming to be unaware of other people nearby, being inconsolable, and having no recall of the incident in the morning. These incidents may last between two and forty minutes, and tend to be worse if the child is tired or sick.



## Section 2: What works?

### Recommended strategies

Sleep problems in children from birth to four years can be categorised into two groups:

1. Sleep settling problems
2. Night waking

A range of treatments for settling and night waking problems in children over six months old include the following:

- *Behavioural interventions* are strategies for teaching children to fall asleep on their own rather than with the assistance of an adult.
- *Medical interventions* involve the use of either trimazepazine or niaprazine at night to treat sleep problems.
- *Mixed interventions* involve the use of medication along with a behavioural strategy.
- *Informational interventions* include the provision of a non-directive informational booklet or advice on sleep, with or without support visits.

**Behavioural interventions have been found to be the most successful intervention.** Research evidence has shown behavioural interventions most likely to be effective include: positive routine, controlled comforting (or controlled crying), systematic ignoring, and scheduled waking. Camping out is an additional intervention which has been researched. A summary of the research leading to these conclusions is included in Section 3 “What the research shows”.

**Behavioural interventions have been found to be the most successful intervention.**

# Section 2: What works?

## Understanding behavioural interventions

### Key points

- Behavioural interventions are generally used for children over six months of age. Younger infants may still require night feeds, may still be establishing a mature sleep-wake rhythm and may not respond to behavioural management techniques.
- Many strategies fit under the category of behavioural intervention. Each involves teaching the child to fall asleep without parental or carer effort.
- Behavioural interventions involve practitioners or health professionals working with a family to develop an individualised sleep management plan with appropriate strategies, supporting them to carry out the strategies, and providing advice about related issues such as bedtime routines, daytime sleeps and practices that may contribute to sleep problems.
- Some behavioural interventions may be at odds with a parent's or carer's natural way of relating to a child. One example is controlled comforting, which requires that the adult leave the child to cry, when the adult's inclination may be to always pick up and console a crying child. Generally parents and carers must be comfortable with the strategy in order for it to be effective.
- An underlying assumption behind behavioural interventions is that the way children are settled to sleep will become their preferred way to return to sleep after waking naturally. For example, an infant who falls to sleep in a parent's or carer's arms is likely to want to return there to be settled if he or she wakes during the night. The aim of behavioural intervention is to help a child 'unlearn' problematic settling behaviour and replace it with more constructive behaviour (that is, falling to sleep without the help of an adult).

## Section 2: What works?

### What you can do

There are a range of strategies that could be undertaken to support parents to address settling and sleeping issues, these include:

- Positive routine
- Controlled comforting
- Systematic ignoring
- Scheduled waking
- Camping out

In addition to choosing a technique with a parent or carer, the professional needs to ensure that the infant has a good bedtime routine and is getting enough sleep during the day.

Following is more detail about each of these strategies.

#### Positive routine

Positive routine is a strategy for dealing with toddlers and pre-school aged children who show resistance to settling once they are put to bed at night.

Before using this strategy, information is collected about a child's typical sleep routine and used to select an ideal bedtime for the child (based on when he or she naturally falls asleep).

The positive routine consists of:

- Initially involving the child in a series of pleasurable activities in the 20-minute period before bedtime and praising the child after each activity.
- At the end of the 20-minute 'positive period' the adult tells the child to go to sleep. If the child resists, the adult tells the child firmly that it's time to go to bed.
- The final step of the positive routine involves bringing the child's bedtime forward. This begins a week after introducing the 'positive period' and involves shortening the 'positive period' by five to ten minutes each week until the child has an acceptable bedtime.

The length of time required for the positive routine to work varies according to how quickly the 'positive period' can be successfully shortened each week. Typically, the 'positive period' needs to be shortened gradually rather than quickly and the routine takes a few weeks to be effective.

## Section 2: What works?

### Controlled comforting

Controlled comforting involves spending only a short time settling the infant and then leaving him or her to settle alone.

The parent or carer responds to crying by looking in on the infant but not taking him or her out of the cot (or bed), and intervals for looking in are gradually increased.

The following routine for controlled comforting has a strong basis in research:

- When settling the infant, the adult either talks to or pats the infant for one minute only.
- As soon as the infant is quiet, or after one minute, the adult leaves the room.
- If the infant starts to cry, the adult waits a set amount of time before going in (perhaps two minutes at first).
- The infant is left for intervals that slowly increase in length – for example, initially 2 minutes, then 2-minute increments, or 5-minute increments if the adult can manage longer intervals.
- If the infant is still crying after each interval, the adult returns and talks to or pats the infant for one minute or until the infant is quiet (depending on adult's preference), then leaves again.
- The process is continued until the infant falls asleep without intervention.

While some people may have concerns about the potential harm of this approach for an infant, there is no evidence to suggest that psychological or physical harm comes from using this approach, and there is much evidence to suggest its effectiveness.

Some tips for using this approach include:

- Use a clock to time intervals,
- Turn off infant monitors,
- Don't wait outside the infant's room, and
- Ensure that the adult has no important commitments for the first few days after starting the intervention.

Controlled comforting should be accompanied by an appropriate predictable bedtime routine (for example, meal, bath, feed, quiet play for 15-20 minutes, into bedroom, brief cuddle and kiss, and into bed) and daytime naps.

With controlled comforting, effects are obtained quickly, typically after between three and fourteen days.

**... there is no evidence to suggest that psychological or physical harm comes from using this approach (controlled comforting)**

## Section 2: What works?

### Systematic ignoring

Systematic ignoring (also called extinction) is similar to controlled comforting but is a stricter approach.

If the child is crying:

- The parent or carer goes to the room to check that the child is not sick or in need of a nappy change, but does not soothe or interact with the child. The adult then leaves and does not return for the time that it takes the child to stop crying.
- Further crying episodes through the night are responded to using the same approach.

Systematic ignoring has been successfully used to reduce night waking but obviously requires a tough approach from the adult, who needs to be comfortable leaving the child to cry for what could be long periods of time.

Systematic ignoring involves a great deal of energy and commitment from the adult, as the approach is used over an eight-week period.

Success with systematic ignoring has predominantly been with toddlers and pre-school aged children rather than infants.

### Scheduled waking

Scheduled waking is used most commonly with children who have prolonged and persistent night terrors.

It involves:

- Waking a child as much as an hour before she or he is likely to spontaneously wake, and then re-settling the child using the regular bedtime routine.
- Before using this approach the parent or carer must collect information about a child's typical sleep routine in order to know when to wake the child.

While the approach is suited to children having problems with night terrors, it has been used effectively with children who are having problems with night waking.

## Section 2: What works?

### Camping out

Camping out is similar to controlled comforting, as the child is left to settle alone and is not removed from the cot or bed when he or she cries. Camping out is a gentler technique, however, as the parent or carer remains in the room with the child in a bed or chair next to the child.

Camping out involves:

- The adult sitting or lying next to the child and patting or stroking him or her off to sleep.
- When the child is used to falling asleep like this (usually after three nights), the parent or carer remains by the cot until the child falls asleep but no longer strokes or touches.
- When the child becomes used to this routine (usually after three nights), the parent or carer moves the chair or bed a foot away and stays until the child falls asleep.
- After this point the bed or chair is gradually moved to the doorway and out of the room over a period of one to three weeks.

Camping out takes longer than controlled comforting to work and therefore requires more energy, stamina and persistence by the adult.

## Section 2: What works?

### Information for parents

Parents can find additional information on infant and toddler sleep patterns on the following sites:

- BBC Parenting: Sleeping by Heather Welford  
[www.bbc.co.uk/parenting/your\\_kids/infants\\_sleeping.shtml](http://www.bbc.co.uk/parenting/your_kids/infants_sleeping.shtml)
- BBC Parenting: Sleep problems by Eileen Hayes  
[www.bbc.co.uk/parenting/your\\_kids/toddlers\\_sleeping1.shtml](http://www.bbc.co.uk/parenting/your_kids/toddlers_sleeping1.shtml)

The following site has helpful tips and strategies for dealing with sleep problems:

- Sleeping like a baby: About Infants' Sleep by Avi Sadeh  
[www.tau.ac.il/~sadeh/infant/about\\_sleep.html](http://www.tau.ac.il/~sadeh/infant/about_sleep.html)

For information about sleep:

- The Raising Children website is a one-stop resource for parenting information with all the basics on raising children 0-8 years, quality-assured by Australian experts, and supported by the Australian Government.  
[www.raisingchildren.net.au](http://www.raisingchildren.net.au)

For tips and strategies:

[www.raisingchildren.net.au/articles/about\\_this\\_guide.html/context/613](http://www.raisingchildren.net.au/articles/about_this_guide.html/context/613)

# Section 2: What works?

## Key Messages for Professionals

### Understanding sleep

- **Sleep requirements vary greatly depending on age.**  
Generally, newborns require 16-20 hours of sleep every 24 hours, infants (2-12 months) 2-4.5 hours of sleep during the day and 9-12 hours of sleep at night, and toddlers 12-13 hours of sleep over 24 hours.
- **Sleep habits develop as a result of nature and nurture.**  
Sleep habits are learned behaviours that are affected by biological and genetic factors and developmental changes.
- **The sleep cycles and stages change as a child ages.**  
An infant's first year of sleep is made up of active and quiet sleep. These stages of sleep are similar to the adult stages of rapid eye movement and non-rapid eye movement sleep. Active sleep involves head and muscle movements, while quiet sleep involves little or no movement.

### Sleep and settling problems

Sleep problems, including settling problems as well as night waking, are common in both infants and toddlers. At least 36-45 per cent of children aged six months to one year are still waking at night to an extent that parents find problematic, while 25-30 per cent of toddlers have sleep problems. Although sleep problems are less common in pre-school aged children, 15-30 per cent have difficulties falling asleep and wake at night.

### Helping parents deal with sleep and settling problems

- Advice booklets on sleep, with or without support visits, are not effective in addressing sleep problems.
- Behavioural interventions can help children learn to go to sleep initially and after waking.
- A range of specific behavioural interventions for children 6 months and older have good support for their effectiveness. These include interventions such as controlled comforting, camping out, and positive routine.
- There is no strong research evidence that one technique is better than others.
- It is recommended that a decision about what strategies a parent will use should be based on what suits best the parenting style and the family's cultural background.
- Where a behavioural strategy is recommended, a sleep management plan should be developed, ensuring that parents understand how to use the strategy, and they should have information about bedtime routines, daytime sleeps and practices that may contribute to sleep problems.
- Further research is needed on the effectiveness of medication and combining medication with a behavioural strategy before these methods can be recommended.



## Section 2: What works?

### Key Messages for Managers

#### Understanding sleep

Sleep requirements vary greatly depending on age. Generally, newborns require 16-20 hours of sleep every 24 hours, infants (2-12 months) 2-4.5 hours of sleep during the day and 9-12 hours of sleep at night, and toddlers 12-13 hours of sleep over 24 hours.

Sleep habits develop as a result of nature and nurture and are learned behaviours that are affected by biological and genetic factors and developmental changes.

#### Sleep problems

Sleep problems, including settling problems as well as night waking, are common in both infants and toddlers. At least 36-45 per cent of children aged six months to one year are still waking at night to an extent that parents find problematic, while 25-30 per cent of toddlers have sleep problems. Although sleep problems are less common in pre-school aged children, 15-30 per cent have difficulties falling asleep and wake at night.

#### Helping parents deal with sleep problems

- Behavioural interventions can be successfully used to improve settling and waking problems in infants and toddlers.
- Advice booklets on sleep, with or without support visits, are not effective in addressing sleep problems.
- A range of specific behavioural interventions for children 6 months and older have good support for their effectiveness. These include interventions such as controlled comforting, camping out, and positive routine.
- Information sessions or short courses could be run at early childhood facilities on these successful behavioural interventions. As part of the sessions, facilitators should educate parents on how to choose an appropriate strategy, how to implement the chosen strategy, as well as providing advice regarding bedtime routines, daytime sleeps and habits that reinforce sleep problems.
- Since most parents of children with sleep problems suffer from lower well-being levels themselves, behavioural intervention sessions run with groups are likely to provide much needed support for parents.
- A number of families will still require referral to a practitioner for more intensive support.

## Section 3: What the research shows

### Summary of the evidence on sleep and settling interventions

Behavioural interventions have been found to be successful in improving night-time settling and reducing the frequency of night waking. Of the range of behavioural interventions available, the positive routine program, controlled crying, systematic ignoring and scheduled waking are likely to be particularly effective.

Intervention focus	Recommended intervention	Effectiveness
For night waking	Behavioural intervention – systematic ignoring (adult ensures crying child is not ill or wet then leaves) or scheduled waking (child awakened prior to usual waking time and then re-settled)	***
For sleep settling problems	Behavioural intervention – the positive routine program (a ‘winding down’ bedtime routine that is gradually brought forward) or controlled crying (ignoring crying for pre-determined time intervals with duration increasing across the night)	***
For night waking	Medical intervention (use of either trimazepazine or niaprazine at night to treat sleep problems) or mixed, that is, medication used as adjunct to behavioural strategy	*
For night waking	Informational intervention – advice (verbal or booklet) on sleep, with or without support visits	xx

#### Guide to recommendation of effectiveness category

Level of evidence	Effectiveness	Key
Strong to good evidence	Beneficial	***
	Not beneficial	xxx
Fair level of evidence	May be beneficial	**
	May not be beneficial	xx
Requires more studies	May be beneficial (promising)	*
	May not be beneficial (not likely)	x
	Unknown benefits	?

## Section 3: What the research shows

Refer to Appendix 5 for a glossary of terms related to research methodology terminology.

### Key research findings

#### Settling and sleep problems

- **Sleep problems in infants are common.**

By six months of age infants have the ability to go through the night without a feed and to resettle themselves after night waking. However, night waking still occurs in 36-45 per cent of infants aged six months to one year to a degree that is considered problematic by parents<sup>5</sup>.

- **The use of both signalling and self-soothing is common in infants and the ability to self-soothe can vary for a given individual across different nights.**

In a study by Gaylor et al.<sup>10</sup>, 15 per cent of the infants found to be self-soothing on one night were identified as signalling on another night. Further, in work by Keener et al.<sup>11</sup>, infants identified as signallers had at least one silent awakening in the two nights in which their sleep was recorded.

- **The development of sleep disorders can be influenced by many factors including a child's temperament.**

Using measures of sleep derived from maternal and objective ratings, infants displaying qualities associated with an easy temperament (for example, being adaptable, rhythmic, less intense, and less distractible) were found to have fewer sleep problems than infants displaying qualities associated with a difficult temperament<sup>11</sup>.

- **The development of sleep disorders can be influenced by many parental factors, including maternal attachment, feeding after waking and parental presence at onset of sleep.**

When toddlers with and without sleep disorders and their mothers were compared in a study by Benoit et al.<sup>12</sup>, 100 per cent of the mothers of toddlers with sleep disorders displayed an insecure attachment with their child, whereas only 57 per cent of the mothers of toddlers without sleep disorders displayed such an attachment. *(Note, this is not to suggest that if a toddler has a sleep problem there is necessarily a relationship problem present.)*

## Section 3: What the research shows

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In a recent study by Touchette et al. feeding after the child woke was associated with less than 6 consecutive hours of sleep at 5 months. Parental presence at onset of sleep was associated with less than 6 hours of consecutive sleep at 17 and 29 months<sup>13</sup>.

- **The development of sleep disorders can be influenced by attachment to an object.**

In a study of two to three year olds conducted by Crowell et al.<sup>14</sup>, the use of a security object for comfort at bedtime was found to be associated with fewer sleep problems.

- **Sleep problems in toddlers are common.**

Twenty-five to thirty per cent of toddlers suffer from sleep problems, with bedtime resistance found in 10-15 per cent of toddlers and night waking in 15-20 per cent. In a study by Lam, Hiscock, and Wake, 43 per cent of a group of three to four year olds who had sleep problems three years earlier still woke four or more nights per week<sup>5</sup>.

- **Difficulties falling asleep and night waking are still common in pre-school aged children.**

Fifteen to thirty percent of pre-school aged children display difficulties falling asleep and waking at night. Furthermore, five to fifteen percent of toddlers and pre-school aged children have night terrors.

- **Sleep problems in pre-school aged children may become chronic.**

In a study by Kataria et al.<sup>15</sup>, three year olds with sleep problems were followed up at six years old and 84 per cent were found to still have sleep-related problems. Similarly, Richman et al. found that 40 per cent of children who had sleep problems at eight years of age had had the problems since they were three years old.

## Section 3: What the research shows

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### Behavioural interventions

- **Since ways of relating to children vary greatly, parents and carers should choose a sleep intervention that best suits their style.**

Many parents and carers find it difficult to use techniques that involve being less attentive to their child than they usually are, for example, increasing the extent to which they ignore their crying child<sup>11</sup>. France et al.'s study on the effectiveness of a mixed intervention of trimeprazine and systematic ignoring indicates that parents are somewhat reluctant to give drugs to their child. If parents or carers are unsure about or uncomfortable with a particular intervention, then their implementation of it would not be expected to be satisfactory<sup>9</sup>.

- **The content of advice rather than the way it is delivered appears to be the important predictor of the effectiveness of an intervention.**

Where advice from pamphlets is based on *sound behavioural principles* of what can be done to treat a sleep problem, for example, this advice has been shown to be effective in treating behavioural problems<sup>5</sup>. This is the case even though the approach is not particularly direct or engaging. In contrast, in a study by Scott and Richards, parents were given pamphlets containing *general sleep information* and their children's sleep problems were not altered as a result. This was the case even though the information was combined with support visits<sup>6</sup>. Together these studies suggest that it is the content of advice that is important in addressing children's sleep problems rather than the way the advice is delivered.

- **The positive routine program is likely not only to eliminate sleep problems but also to lead to broad improvements in the quality of family relationships.**

Adams and Rickert<sup>2</sup> evaluated the effect of children's bedtime tantrums on their parents' relationships as well as the effectiveness of behavioural interventions. They found that a significant number of relationships were perceived as improved by parents in the positive routine group. Anecdotal accounts from parents attributed the improvement to lowered family stress because of reduced crying and disturbance from the children<sup>3</sup>.

## Section 3: What the research shows

### Interventions for common sleep problems

A summary of the evidence on interventions for addressing common sleep problems in young children follows. Although they co-occur commonly, night waking and settling problems have typically been studied separately, and therefore have been separated here also.

#### Target group: Night wakers

- Children six months to four years old
- Absence of a learning disability, physical problem or mental health problem
- Parent-identified problem
- Problem defined as “waking frequently, waking for long periods, or both”

#### Key Findings<sup>2,3,4</sup>

*Behavioural interventions* have been shown to be effective in reducing the frequency of night waking and the duration of episodes, with effects maintained at short-term follow-up. These interventions have strong empirical support from multiple randomised control trials.

*Systematic ignoring, scheduled waking and controlled crying* (with support for parents) have strong empirical support. The effect each has had on night waking is significantly greater than a control group. Further testing is required to conclusively determine if one type of behavioural intervention is more effective than another.

*Medical interventions* employing trimeprazine were found to be effective in reducing both the frequency and duration of night waking. The clinical importance of these results is uncertain however as there was no evidence of an effect over time.

The use of *trimeprazine with systematic ignoring* was also found to be effective, although it too did not have a sustained effect over time. These findings are based on multiple randomised control trials.

Initial research on *mixed interventions* is encouraging; however, further testing is required to confirm their effectiveness and contrast them with behavioural interventions alone.

## Section 3: What the research shows

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### Target group: Problem settlers

- Children six months to four years old
- Absence of a learning disability, physical problem or mental health problem
- Parent-identified problem
- Defined as “taking a long time or refusing to settle at night, or tantrums at bedtime”

### Key Findings<sup>2,3,4</sup>

*Behavioural interventions* were found to be effective in reducing settling problems; however their long-term effects are yet to be established. There have been fewer randomised control trials for settling problems than for night waking.

*The positive routine program and controlled crying* (with support for parents or carers) have strong empirical support. The effects of each were greater in a treatment group than a control group, both at the time of treatment and six weeks later). Although empirical evidence is not available, anecdotal accounts from the research suggest that the positive routine program achieves quicker results than controlled crying, is more easily understood by parents and carers and is their favoured approach.

*Medical intervention*, that is, the use of trimeprazine, was found to be effective in reducing settling problems. However, this evidence comes from only one study, and the effect was not present in a six month follow-up.

## Section 3: What the research shows

### Annotated summary of intervention studies

Following is:

- A summary of the intervention studies that were used to inform this resource
- An annotated summary of the behavioural interventions
- An annotated summary of the medical interventions

#### Summary of intervention studies

Focus of study	Author
Behavioural intervention: Systematic ignoring compared with scheduled wakes with sleep diary only <sup>1</sup>	Rickert and Johnson, 1988
Behavioural intervention: Positive routines compared with controlled crying with sleep diary only <sup>2</sup>	Adams and Rickert, 1989
Behavioural intervention: Modified extinction and support visits compared with modified extinction only <sup>3</sup>	Pritchard and Appleton, 1988
Behavioural intervention: Behavioural advice booklet and support visits compared with sleep program advice only <sup>4</sup>	Seymour et al., 1989
Behavioural intervention: Controlled crying and support compared with information sheet on sleep patterns <sup>5 6</sup>	Hiscock and Wake, 2002 Lam, Hiscock and Wake, 2003
Informational intervention: Advice booklet on sleep and support visits compared with booklet only or no advice <sup>3</sup>	Scott and Richards, 1990
Medical intervention: Trimeprazine compared with placebo <sup>7 8</sup>	Richman, 1985 Simonoff and Stores, 1987
Medical intervention: Niaprazine compared with Chlordesmethyl diazepam <sup>3</sup>	Montanari et al., 1992
Mixed (medical intervention and behaviour modification): Trimeprazine and extinction compared with extinction and placebo <sup>9</sup>	France et al., 1991

Practice resource:

SETTLING AND SLEEP PROBLEMS



## Annotated summary of behavioural interventions

Study	Participants	Intervention	Targeted Behaviour	Results	Comments
Rickert, M and Johnson, C (1988) <sup>1</sup>	33 children aged 6-54 months	Scheduled wakes or systematic ignoring  Control: sleep diary only	Number of night wakes per week	Both intervention groups had significant improvement compared with control group	Effect maintained at six-week follow-up with significant difference between groups
Scott, G and Richards, M (1990) <sup>3</sup>	90 children aged 1-18 months	Non-directive information booklet and support visits, or booklet only  Control: Sleep diary only  Booklet – to help parent adopt realistic expectations and attitudes towards their child's sleep	Number of night wakes per night	No difference between treatment groups and control	
Adams, L and Rickert, V (1989) <sup>2</sup>	36 children aged 18-48 months	Positive routines or controlled crying  Control: Sleep diary only	Number bedtime tantrums per week (frequency and duration)	Both intervention groups had significant improvement compared with control group	Effect maintained at six-week follow-up with significant difference between groups

Practice resource:

## SETTLING AND SLEEP PROBLEMS

Study	Participants	Intervention	Targeted Behaviour	Results	Comments
Pritchard, A and Appleton, P <sup>3</sup>	31 children aged 9-42 months	Modified extinction program and support visits  Control: Modified extinction plan only	Number of night wakes per night	Both showed a reduction with no difference between groups	
Seymour F et al. (1989) <sup>4</sup>	45 children aged 9-42 months	Multifaceted sleep program (behavioural advice booklet and support) or behavioural booklet only  Control: Waiting list	Number of night wakes per week	Both interventions significant effect compared with control group	Effect maintained at three-month follow-up  No comparison made between groups
Hiscock, H and Wake, M (2002) <sup>6</sup>  Lam, P Hiscock, H and Wake, M (2003) <sup>5</sup>	156 infants and their mothers	Infant Sleep Study – discussion on use of controlled crying and sleep management plan. Information sheet on normal sleep patterns and management of sleep problems – three consultations  Control: information sheet on normal sleep patterns 6-12 month infants by mail	Night waking and settling problems	At two months, significant improvement in treatment group compared to control group	Four months and three years later, effect maintained for most treatment children, however non-significant difference with controls  Study also looked at changes in postnatal maternal depression scores and found strong correlation between drop in scores and reduced sleep problems

Practice resource:

# SETTLING AND SLEEP PROBLEMS

## Annotated summary of medical interventions

Study	Participants	Intervention	Targeted Behaviour	Results	Comments
Richman, N (1985) <sup>8</sup>	22 children ages 12-24 months	Trimeprazine (30-60 mg)  Control: Placebo	Number of night wakes and settling problems	Significant reduction in number of night waking incidents in the short term (first 10 days) in treatment group	Longer term effect not seen at six month follow up
Simonoff, E and Stores, G (1987) <sup>7</sup>	20 children ages 12-36 months	Trimeprazine (45-90 mg)  Control: Placebo	Number of night wakes (frequency and duration)	Significant reduction in number of night waking incidents in the short term (first 10 days) in treatment group	Longer term effect not seen at six month follow up
France, K et al. (1991) <sup>9</sup>	30 children ages 7-27 months	Trimeprazine (30 mg) and behaviour modification technique of systematic ignoring  Control: Placebo plus systematic ignoring	Night waking (frequency and duration)	Significant reduction in number of night waking incidents in the short term (first 10 days) in treatment group	No sustained longer term effect  Parental reports of daytime drowsiness for infant
Montenari, G et al. (1992) <sup>3</sup>	60 children ages 7-27 months	Niaprazine  Control: Chlordesmethyl diazepam	Night waking (frequency)	Both groups improved and no significant difference in effectiveness of 1 drug over other	

Practice resource:

## SETTLING AND SLEEP PROBLEMS

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13. Touchette, E., et al., *Factors associated with fragmented sleep at night across early childhood*. *Arch Pediatr Adolesc Med*, 2005. **159**: p. 242-249.

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14. Crowell, J., et al., *Sleep habits in toddlers 18 to 36 months old*. Journal of the American Academy of Child and Adolescent Psychiatry, 1987. **26**: p. 510-515.
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# Appendix 1

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## Centre for Community Child Health

The Centre for Community Child Health's mission is to improve the health and wellbeing of all children.

At the forefront of Australian research into early childhood development and behaviour, the Centre has a particular interest in children's mental health; obesity; language, learning and literacy; hearing; and the development of quality early childhood services.

The Centre is committed to disseminating its research findings to inform public policy, service delivery, clinical care and professional practice.

Professor Frank Oberklaid, an internationally renowned researcher, author, lecturer and consultant, leads a team of over 90 staff from a range of disciplines including paediatrics, psychology, education, early childhood, public health and communications.

Located at The Royal Children's Hospital, Melbourne, the Centre is a key research centre of the Murdoch Childrens Research Institute and an academic centre of the University of Melbourne.

Further information about the Centre for Community Child Health can be found at [www.rch.org.au/ccch](http://www.rch.org.au/ccch)

## Appendix 2

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### Telstra Foundation

In 2002, as part of its strong tradition of community involvement, Telstra established the Telstra Foundation, a program devoted to enriching the lives of Australian children and young people and the communities in which they live.

The Telstra Foundation supports projects that develop innovative solutions and new approaches to issues affecting children and young people aged 18 years and under, are based on sound research, and develop practical applications of new knowledge and have an emphasis on early intervention.

The Telstra Foundation has two main programs, with the *Community Development Fund* providing the funding for the practice resource. The Community Development Fund provides grants to charitable organisations for projects that have wide impact and intervene early to address causal factors affecting the health, well-being and life chances of Australia's children and young people.

Further information about the Telstra Foundation can be found at:

<http://202.12.135.148/dir148/tfweb.nsf/webdocs/home~home?opendocument>

## Criteria for selecting topics

There were a number of criteria used for selecting the topic for each practice resource. These included:

- *Importance of the issue in relation to children's health and development*  
There are a number of issues that are very prevalent and impact both on the immediate health and development of the child as well as the impact over the life course.
- *Provider need*  
Through various forums providers have requested easier access to research based information that will assist directly in their daily interactions with children and families.
- *Community need*  
Around Australia there is increasing community activity focusing on early childhood. A number of these communities have begun to articulate the desire to support families more effectively through providing services that engage in family centred practice and use research based strategies to address issues that concern parents.
- *Parent need and concern*  
National consultations have highlighted the issues that parents want more information about. In addition, Australian research has shown that there are a small number of issues that cause parents the most concern about their children.
- *Perceived gap between evidence and practice*  
There are a number of areas of practice which in general do not reflect research evidence in spite of sound evidence from that research.
- *Can be readily incorporated into routine practice*  
The primary aim of each resource is to assist professionals in their interactions with children and families. Priority was given to issues about which strategies could be relatively easily incorporated into practice.
- *No duplicating of effort*  
Consideration was given to whether issues had been addressed elsewhere in similar ways for the same audience.



# Appendix 4

## NHMRC Guidelines for Levels of Evidence

- |       |  |
|-------|--|
| I     | Evidence obtained from a systematic review of all relevant randomised controlled trials.   |
| II    | Evidence obtained from at least one properly designed randomised controlled trial.   |
| III-1 | Evidence obtained from well-designed pseudo-randomised controlled trials (alternate allocation of some other method).  |
| III-2 | Evidence obtained from comparative studies with concurrent controls and allocation not randomised (cohort studies), case-control studies, or interrupted time series with a control group. |
| III-3 | Evidence obtained from comparative studies with historical control, two or more single-arm studies, or interrupted time series without a parallel control group.                           |
| IV    | Evidence obtained from case series, either post-test or pre-test and post-test.  |

# Appendix 5

## Glossary of Terms – Research Methodology

Note: Wherever possible these definitions are taken from the *Glossary of Terms in the Cochrane Collaboration, Version 4.2.5, updated May 2005*.

<b>Case-control study</b>	A study that compares people with a disease or outcome of interest (cases) with people from the same population without that disease or outcome (controls), and which seeks to find associations between the outcome and exposure to particular risk factors
<b>Cochrane Review</b>	Systematic summaries of evidence of the effects of health care interventions, intended to help people make practical decisions. For a review to be called a Cochrane Review it must be in the Cochrane Database of Systematic Reviews or the Cochrane Review Methodology Database. These are administered by the Cochrane Collaboration, an international organisation that aims to help people make well-informed decisions about health care.
<b>Control</b>	A participant in a randomised controlled trial who is in a group that acts as a comparator for the experimental intervention(s); alternatively, a participant in a case-control study who is in a group that does not have the disease or outcome of interest.
<b>Control trials</b>	Studies in which participants are assigned to an intervention or control group using specific criteria.
<b>Effectiveness</b>	The extent to which a specific intervention, when used under ordinary circumstances, does what it is intended to do.
<b>Evidence</b>	Up-to-date, accurate information about the effects of interventions.
<b>Randomised controlled trial (RCT)</b>	An experiment in which two or more interventions are compared by being randomly (like tossing a coin) allocated to participants.