



Australian Association for  
Infant Mental Health

## Infant Sleep

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### Purpose of AAIMH

**The Australian Association for Infant Mental Health Ltd (AAIMH) is a not-for-profit organisation of professionals from a range of disciplines including health, education and welfare dedicated to the field of infant mental health.** AAIMH's mission is to work for all infants and young children from pre birth to age three to ensure their social, emotional, and developmental needs are met through stable and nurturing relationships within their family, culture, and communities. This is achieved by assisting families, professionals, and communities to build nurturing and strong relationships with their children, and to be aware of the causes and signs of mental, physical, and emotional stress in infants.

### Definitions

#### *Infant Sleep*

Sleep is a complex neurobehavioural state and sleep behaviour must be viewed within a biopsychosocial framework (Jenni & Carskadon, 2007). While biological processes are dominant, infant sleep is most effectively conceptualised as a complex adaptive system, in which there is a constantly evolving interplay between cultural, psychosocial, temperamental, environmental and biological factors (Douglas, Hill, & Brodribb, 2011; Jenni & O'Connor, 2005).

There are two sleep regulating mechanisms in the human body. The first is the circadian rhythm, also known as the body clock. The circadian rhythm regulates physiological, behavioural, and metabolic states, including the sleep wake cycle throughout the 24-hour day. Newborn infants do not demonstrate a circadian rhythm to their sleep wake cycle at birth. However, a circadian pattern emerges in the first few months of life, regulated by exposure to light, noise, activity and social cues (Jenni & Carskadon, 2007). The second regulating mechanism is known as homeostatic pressure. The need to sleep (sleep pressure) increases as the duration of wakefulness increases, and the younger the infant, the less time they can manage awake (Jenni & Carskadon, 2007).

Infants have different sleep cycles from adults. They have shorter sleep cycles, generally lasting between 45-60 minutes. The infant's sleep cycle is characterised by alterations between rapid eye movement (REM) sleep and non-rapid eye movement sleep (NREM). During REM, brain growth and differentiation of neuronal pathways occur, while in NREM

**Australian Association for Infant Mental Health Limited**

44 Fullarton Rd, Norwood SA 5067 | ABN 88 625 753 522 | ACN 625 753 522 [info@aaimh.org.au](mailto:info@aaimh.org.au) |  
[www.aaimh.org.au](http://www.aaimh.org.au)

Affiliated with the



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rest occurs, with organisation of the infant's immature nervous system. The infant spends a greater amount of time in REM sleep compared to children and adults, where sleep is light, and the infant is more easily disturbed. This can cause them to arouse/waken more often in the night (Mares, Newman, & Warren, 2012). They may also be hungry and need feeding as they have small stomachs. Therefore, it is normal for infants and young children to wake through the night and to need attention from parents or caregivers. There is a wide variation in the age at which infants and toddlers 'sleep through the night,' On average, 83% of infants at three months, and 77.7% of infants at eight months still require support to settle during the night (Paavonen et al., 2020).

### *Crying*

A signal of distress or discomfort (either psychological or physical) from an infant or young child to let the caregiver know that they need help. From an evolutionary perspective, crying promotes proximity to the primary caregiver, in the interest of survival and the development of social bonds (Bowlby, 1958).

### *Sleep problems*

Currently, between 25-40% of families report sleep problems in infancy and early childhood, most often described as delayed sleep, frequent night wakings or inability to return to sleep without parental presence (Paavonen et al., 2020; Price et al., 2014; Sadeh, Mindell, Luedtke, & Wiegand, 2009). However clinically, infant sleep is often only viewed as a problem if the parent/carer perceives it as a problem (Barr, 1993). Prolonged sleep problems can negatively impact a child's cognitive development, mood regulation, behaviour and physical health (Mindell, Kuhn, Lewin, Meltzer, & Sadeh, 2006). Parent and caregiver sleep and wellbeing are also impacted, with ongoing reduced sleep associated with increased feelings of stress, anxiety, depression and perceived ability to cope (Etherton, Blunden, & Hauck, 2016). In more extreme examples, it can contribute to child abuse (James-Roberts, 2007).

Infants and young children who wake often, do not settle easily, or do not sleep through the night are sometimes said to have *sleep problems*. Differences in infant sleep patterns may be influenced by a number of factors including:

- Infant temperament
- Development processes
- Infant feeding practices
- Parental/carer expectations related to infant crying and sleep
- Parenting philosophies or practices
- Family relational dynamics
- Psychosocial factors including changes in the care giving environment
- Infant health issues
- Parental/carer health issues, including physical and mental health concerns
- Physical sleeping arrangements including infants bed sharing, sleeping in a separate bed and/or room from parents or carers
- Developmental problems

### *Extinction Based Behavioural Sleep Interventions*

Extinction Based Behavioural Sleep Interventions are based on Skinner's behaviourist theory of operant conditioning in learned behaviour (Skinner, 1984). With infant sleep problems, the parent or carer's attention is perceived to reinforce the infant's crying. Therefore, extinction methods aim to improve infant sleep by removing/reducing caregiver attention during sleep times to eliminate crying, with the view that this will encourage the infant to self-settle (Hiscock & Davey, 2018). The most common extinction methods reported in the literature are unmodified extinction, extinction with caregiver presence and graduated extinction. All of these methods involve, to some extent, ignoring the infant's crying once she has been put to bed. If there are interactions, they are brief and involve limited settling support. Table 1 presents a summary of these methods.

Table 1.

<b>Intervention Name</b>	<b>Colloquial Name</b>	<b>Procedure Summary</b>
<b>Unmodified extinction</b>	Cry it out	Child is put to bed and ignored until a set wake time
<b>Graduated extinction</b>	Controlled comforting, controlled crying, sleep training	caregivers ignore the child's crying for set periods of time before returning to settle (using limited techniques) and repeating until the infant sleeps. May use a fixed scale (e.g., every 5min) or an incremental scale (e.g., 2, 4, 6min)
<b>Extinction with caregiver presence</b>	Caregiver presence, camping out	Caregiver ignores the child's crying but remains near the child in the room until they fall asleep offering limited settling techniques. The caregiver gradually increases the physical distance from the child

Adapted from Etherton, Blunden, & Hauck, 2016

### **Extinction Based Behavioral Sleep Intervention Research:**

Extinction based behavioural sleep interventions are by far the most common intervention in infant sleep research, with 81% of all infant sleep intervention literature focused on these approaches (Etherton et al., 2016). Notably, 61% of sleep advice books aimed at caregivers endorse extinction based approaches (Ramos & Youngclarke, 2006). Despite this, there remains great variation and controversy in the findings about the efficacy of these interventions.

Several systematic reviews and meta-analyses have been conducted on behavioural sleep interventions, including extinction based strategies (Bryanton, Beck, & Montelpare, 2013; Douglas & Hill, 2013; Kempler, Sharpe, Miller, & Bartlett, 2016). All of these reviews vary in their conclusions, reflecting methodological concerns, variations in outcome measures, possible interpretation bias, the multicomponent nature of many interventions, and the

complexity of infant sleep concerns. Those reviews that do conclude benefit, suggest that any increase in maternal reported infant sleep time is small to moderate and is unlikely to reduce the number of night wakes. There is also indication that there may be an improvement in maternal mood, but again this finding is questionable given the multicomponent nature of the interventions (Kempler et al., 2016). For example, in one randomized controlled trial, mothers rated 'having someone to talk to' as the most useful component of the intervention (Hiscock et al., 2014).

Concerns also remain about the long term implications of extinction based sleep interventions, mainly the impact on infant mental health and the caregiver-child attachment relationship (Etherton et al., 2016). While there are some longer term follow up studies that have attempted to address these issues (Middlemiss, Granger, Goldberg, & Nathans, 2012; Price, Wake, Ukoumunne, & Hiscock, 2012), questions have also been raised about the methodologies used in these studies (Middlemiss, 2013).

While it may be argued that extinction based behavioural sleep interventions have some positive effect, parental reluctance to use these types of interventions has been known for over 30 years (Etherton et al., 2016). Australian research suggests that nearly three quarters of parents either chose not to use controlled crying or started it and stopped, due to concerns that it would have an emotionally detrimental effect on the infant and/or parent (Baills, 2013). The significant parental reluctance to implement extinction based behavioural sleep interventions are due to concerns they may be too traumatic for parents or infants, conflict with views about parenting, or be impractical (Tse & Hall, 2008). Interestingly, those parents who chose not to use controlled crying were likely to be more emotionally focused on their infant, where those that did were more likely to be outcome focused (Baills, 2013). When parents are only offered extinction based behavioural sleep interventions as an option to support infant sleep, many may choose not to utilise them, even if they have no other strategies to improve sleep, maintaining difficulties and compounding risk (Blunden & Dawson, 2020).

#### Alternatives to Extinction Based Behavioral Sleep Interventions:

Other approaches to supporting infant sleep have been less widely studied. There is suggestion in the literature that 'responsive' sleep interventions are associated with improved infant and caregiver sleep (Blunden & Dawson, 2020; Mesman et al., 2018; Middlemiss, Stevens, Ridgway, McDonald, & Koussa, 2017; Mihelic, Morawska, & Filus, 2017; Whittingham & Douglas, 2014). However, there is no consistent definition in the literature as to what constitutes a response-based approach. The most common theme involves responding to an infant's cues at sleep time, rather than ignoring or delaying responses. These approaches may be favoured by many caregivers as they avoid the perceived stress to both caregiver and infant when crying occurs for prolonged periods. (Blunden & Dawson, 2020)

Despite the comparatively limited research, an evidence base is emerging to support such approaches. A mother's emotional availability has been shown to be associated with fewer night wakings and a reduction in the number of times a mother had to return to their infant at bedtime (Teti, Kim, Mayer, & Counterline, 2010). Research demonstrating that teaching parents to understand and respond to infant cues both during the day and night results in an increase in total infant sleep time, including with mothers experiencing depression, anxiety

and stress (Middlemiss et al., 2017). A recent meta-analysis of parenting interventions (not necessarily sleep focused) demonstrated that teaching parents' attachment-based interventions aimed at increasing parental responsiveness resulted in significantly better parent reported infant sleep behaviours. Interestingly, the authors propose that the practice strategies of attachment based interventions, including facilitator modelling, video feedback and active encouragement were central to the success of the interventions (Mihelic et al., 2017). This supports research that suggests that when interventions aimed at supporting infant sleep move beyond the focus of reducing infant crying, to a broader strategy of supporting caregivers and strengthening the caregiver-infant relationship to enhance parenting capacity, they can enhance parental wellbeing, improve sleep, as well as reduce infant crying (Gilkerson, Burkhardt, Katch, & Hans, 2020; Whittingham & Douglas, 2014). While response based approaches to sleep are consistent with the infant's attachment needs, it is important to recognise that there is no empirical evidence to demonstrate this type of intervention results in secure attachment (Črnčec, Matthey, & Nemeth, 2010).

### Further Considerations:

#### *The Early Years as a Foundation for Lifelong Health*

The antenatal period and the early years of life are critical for development. The foundations for lifelong health are built early. What happens during this period can have substantial effects on both short- and long-term outcomes in physical and mental health. No other developmental stage is more heavily influenced by the external environment, especially the care giving environment. Young children living in an environment with sensitive and responsive relationships, where their needs are recognised and met, are more likely to develop well-functioning biological systems, including brain circuits that support positive development and lifelong health (National Scientific Council on the Developing Child 2020).

#### *Attachment Relationships*

Attachment theory has been described in psychology as one of the most relevant developmental constructs ever investigated (Sroufe, Egeland, Carlson, & Collins, 2005). Attachment bonds refer to the emotional connections between people in intimate relationships. Although attachments can occur in a variety of relationships, in this paper we are focusing on the caregiver -child relationship (Zeanah & Boris, 2000). Attachment theory is focused on how young children's early relationships affect their ongoing development. In infants and young children, attachment is characterised by specific behaviours such as proximity seeking, communicative behaviours and staying close to the caregiver when upset or threatened in order to achieve emotional and physical safety (Zeanah & Boris, 2000).

Infants develop patterns of attachment in relation to the characteristics of the carer's response, and infants have different attachment relationships with different carers. The quality of each attachment relationship depends mainly on the responsiveness and sensitivity of the carer (Bowlby, 1980). The most important factor in determining the quality of the relationship is not the amount of time spent with the child or who provides the tasks of caring, but who interacts with the child and responds sensitively to their needs (Bowlby, 1980). Overtime, repetitive experiences within early relationships generate what is termed an 'internal working model' (IWM). The IWM is the individual's mental representation of the worthiness of self and the availability of others. The IWM is central to the process of

interpreting experiences, learning from the past and guiding and influencing future experience (Raikes & Thompson, 2008; Siegal, 1999).

Attachment theory is well supported by a large body of evidence examining the association between early attachment patterns and later outcomes (Raikes & Thompson, 2008). When caregivers respond in a prompt, consistent and sensitive manner to their infant's crying, the infant is reassured that the caregivers are available for comfort and the infant feels safe. When these experiences are repeated consistently, the infant develops a secure attachment (Mares et al., 2012). Children with a secure attachment have a strong developmental foundation, with more positive social and emotional outcomes, including the ability to regulate their emotions, better social competence, and a higher sense of self-worth (Raikes & Thompson, 2008).

### *Infant Development*

In the first few years of life, infants and young children rely almost entirely on their caregivers to meet their physical and emotional needs. In the early months of life, unexplained and sometimes difficult to soothe crying exists across all cultures and may be seen to be a part of normal development. *While this can be distressing for caregivers, this natural increase in crying peaks at around six to eight weeks and generally settles by three to four months (Barr, 1998). There is great variation in normal infant sleep behaviour, and night wakings are normal for children under one year of age. The number of night wakings and staying awake at night in infants under one year of age is not associated with adverse developmental outcomes (Pennestri et al., 2018).*

At around eight months, infants may begin to express distress when a caregiver is absent even for only a brief moment. This 'separation anxiety' is a normal part of age-appropriate development and often coincides with the infant's development of 'object permanence' when they realise that things and people exist even when they are out of sight. Infants may cry at times of separation as they may believe that their caregiver has abandoned them (Mares et al., 2012). Separation anxiety usually peaks around 14-18 months of age and settles down by two to three years of age when the child has a core understanding and enough experience to trust the caregiver will return and he or she is safe (Mares et al., 2012). Sleep time may represent a time of perceived separation for the infant. When infants or toddlers cry upon separation at bedtime it is a signal that they may be struggling with this process and need reassurance. Infants whose caregivers respond promptly and empathically to their crying learn to settle as they become secure in the knowledge that their needs for emotional comfort will be met (Bell & Ainsworth, 1972; Higley & Dozier, 2009).

There are various times in children's development (illness, carer absence, major changes) when they need more assistance with sleep and settling than at other times. Family events that are distressing for the infant may lead to a need for more support and reassurance than in non-stressful times. To deny reassurance to the infant during these times is distressing and may have a negative psychological impact. (Szalavitz & Perry, 2010)

### *Culture*

While infant sleep is largely a biologically driven behaviour, it is strongly influenced and interpreted by the cultural values of the caregivers and broader community (Jenni & O'Connor, 2005). Extinction based behavioural sleep interventions have their origins in neo-liberal Western childrearing practices that place a greater value on individualist parenting approaches that promote independence from a young age (Etherton et al., 2016; Maute & Perren, 2018). These practices and beliefs suggest that an infant's ability to self-settle is central to their progress towards self-regulation and independence (Mesman et al., 2018). This is supported by the fact that the large majority of research into behavioural based sleep interventions has been conducted in urban Western populations (Mesman et al., 2018). Across different cultures, beliefs vary about how, why and where infants should sleep, as well as what defines normal sleep or a sleep problem. Sleep behaviour is problematic only in relation to the caregivers and communities expectations, rather than a clearly defined evidence-based definition of a sleep problem (Etherton et al., 2016). The demands of modern life, changes to family structures and a 'child illiterate' society have led to an expectation that all infants and toddlers should sleep through the night from the early months or even weeks.

### *Bed sharing*

Bed sharing is defined as where a parent or carer and infant are both sleeping while sharing a sleep surface together (Mileva-Seitz, Bakermans-Kranenburg, Battaini, & Luijk, 2017). In Australia, the current national Infant Safe Sleep recommendations suggest that infants should have their own sleep space in their parent's room for the first 6-12 months of life (Red Nose, 2018). However, individual state and territory health departments have also developed their own slightly modified guidelines. This has created inconsistencies in messaging, especially in the area of bed sharing which has a developing evidence base. Recent Australian research has highlighted that the infant sleep practices of many families contradict these guidelines. 77% of infants had shared a sleep surface with another person at some time, with over 50% of families indicating this was not planned (Cole, Young, Kearney, & Thompson, 2020). Also, one in four infants spent two or more nights a week sharing a sleep surface (Cole et al., 2020). In 2018 Red Nose, the NGO primarily responsible for developing infant safe sleep public health programs released a position statement on sharing a sleep space. This statement supports families to make bed sharing as safe as possible, recognises the many benefits associated with sharing a sleep space including improved breastfeeding outcomes, improved maternal sleep and improved infant settling with less crying and reduced stress response (Red Nose, 2019). However, this message is yet to be clearly received or delivered by professionals working with families and infants. Many families still do not receive a balanced discourse on bed sharing, depriving them of the ability to make an informed choice for their family (Cunningham, Vally, & Bugeja, 2018; Marinelli, Ball, McKenna, & Blair, 2019).

## AAIMH's position – Extinction Based Behavioral Sleep Interventions

AAIMH is concerned that extinction based behavioural sleep interventions are not consistent with the infant's needs for optimal emotional and psychological health and may have unintended negative consequences. Extinction based behavioural sleep interventions have not been rigorously assessed in terms of the impact on the infant's emotional development. While arguably there is evidence to suggest these techniques do not harm infants, this does not mean there is evidence of no harm.

These type of sleep interventions are at odds with the overwhelming body of evidence that shows that the foundations for lifelong physical and psychological health are laid down in infancy when distress is responded to in a prompt and reliable way (National Scientific Council on the Developing Child 2020).

Although extinction based behavioural sleep interventions may reduce infant crying and increase caregiver perceived infant sleep time, they may also have the unintended effect of teaching infants not to seek or expect support when distressed (Blunden, Thompson, & Dawson, 2011; Etherton et al., 2016). A lack of response to infant cries at night, and an inconsistent approach in responding to day and night distress signals may lead to increased infant stress (Porter, 2007).

When concerns are raised by caregivers about sleeping difficulties, a full professional assessment should include:

- Pregnancy details, birth history and infant's history since birth
- Caregiver ability to cope, including medical or mental health conditions, disabilities, drug and alcohol use, time constraints, anxieties, as well as supports
- Description of a 'normal' 24hrs, including bedtime routines and settling strategies
- Infant feeding practices, including observing a feed
- The infant's sleep and communication strategies
- Caregivers developmental expectations of the infant and perception of the infant
- How the infant's sleep is affecting the family
- Any infant medical or developmental concerns
- A brief summary of the family of origin
- What are the caregiver's concerns and what do they want to change?
- What has been done already? What has or hasn't worked?
- A brief period of caregiver -infant observation

(Mares et al., 2012)

This assessment may then lead to a 'shared understanding' of the infant and family's perspective and appropriate support and/or referral.

AAIMH believes the following principles should be applied to all infant sleep interventions:

- Any intervention used to support infant sleep should not compromise the infant's developmental and emotional needs. A comprehensive assessment as detailed above should be conducted with all families.
- It is normal and healthy for infants to wake through the night and to need connection with caregivers. This need not be labelled a problem or disorder. There is a wide variation in how quickly infants settle and 'sleep through the night.' Early and realistic information about what to expect and ways to support infants should ideally be available to all caregivers to help understand their infant's state of mind and appropriately engage with

their infant's sleeping patterns. This includes supporting caregivers to have a sound understanding of the drivers of infant sleep, and variation in normal healthy infant sleep patterns.

- Recognition that caregivers often struggle to adopt extinction based behavioural sleep interventions because they contradict their innate desire to respond promptly to their infant's distress, their own parenting beliefs, or a belief that they may cause the infant harm.
- There is room for human error in responsive caregiver-infant relationships. Caregivers do not need to be perfect; they just need to be good enough. Caregivers will learn to respond sensitively only through close observation of their infant, and trial and error. Caregivers do not need to get this right all the time.
- Responding to an infant's needs/crying will not cause dependency but will contribute to the infant's sense of security and developing regulatory capacity.
- Strategies based on an understanding of the infant's emotional world and their communication strategies should always be discussed with caregivers as preferable options to extinction-based strategies.
- Alternatives to extinction-based sleep interventions need to be made more readily available to caregivers. Caregivers need to be provided with a range of sleep interventions from a variety of theoretical perspectives so they can make an informed choice based on their family's individual circumstances.
- Extinction based behavioural sleep interventions are not appropriate for use before the infant has a real understanding of the meaning of the caregiver's words; the infant needs to know that the caregiver will return and needs to feel safe when the caregiver is absent.
- AAIMH supports the use of 'responsive' based approaches to addressing infant sleep concerns. Such approaches should be attachment informed and tailored to the developmental needs of the individual infant. These approaches should be based on understanding, recognising, and responding to the infant's communication cues in a sensitive and consistent manner that supports their emotional needs and development.
- Culturally appropriate and SIDS informed approaches to co-sleeping need to be discussed with caregivers as potential options to support infant sleep
- AAIMH supports a coordinated effort to develop the evidence base for response-based sleep interventions as an alternative option for caregiver's concerned with their infant's sleep.
- AAIMH supports both universal and tertiary level service providers having increased exposure, access to, and training in a range of sleep interventions to meet the needs of individual families.

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