



Australian Research Alliance  
for Children & Youth

# Understanding and responding to unsettled infant behaviour

A discussion paper for the Australian Research Alliance  
for Children and Youth

Prepared by

Jane Fisher, Heather Rowe, Harriet Hiscock, Brigid Jordan,  
Jordana Bayer, Anne Colahan and Vivienne Amery



# Understanding and responding to unsettled infant behaviour: A discussion paper for the Australian Research Alliance for Children and Youth

## Prepared by:

Jane Fisher <sup>i,ii</sup>, Heather Rowe <sup>i</sup>, Harriet Hiscock <sup>iii</sup>, Brigid Jordan <sup>iv</sup>, Jordana Bayer <sup>iii</sup>,  
Anne Colahan <sup>v</sup>, Vivienne Amery <sup>vi</sup>

- i. Jean Hailes Research Unit, School of Public Health and Preventive Medicine, Monash University, Clayton, Victoria 3168
- ii. Masada Private Hospital Mother-Baby Unit
- iii. Centre for Community Child Health Royal Children's Hospital Melbourne, Murdoch Children's Research Institute, Parkville, Victoria 3052
- iv. Social Work Department & Infant Mental Health Group, Royal Children's Hospital Melbourne, Murdoch Children's Research Institute, Parkville, Victoria 3052
- v. Maternal & Child Health Service, Victorian Department of Education and Early Childhood Development, Melbourne, Victoria 3000
- vi. Tweddle Child and Family Health Service, Footscray Victoria 3011

## About ARACY

ARACY is a national non-profit organisation working to improve the wellbeing of children and young people by advancing collaboration and evidence-based action for all Australia's children and young people.

Despite Australia being a wealthy, developed country, crucial aspects of the health and wellbeing of our young people have been declining. ARACY was formed to progress evidence-based action to prevent the major problems affecting children and young people. ARACY tackles these complex issues through building collaborations with researchers, policy makers and practitioners from a broad range of disciplines.

## Contact us:

If you have any queries about this report please contact ARACY

email: [enquiries@aracy.org.au](mailto:enquiries@aracy.org.au)

ABN 68 100 902 921

© ARACY 2011

ISBN: 978-1-921352-90-4

**The focus of this discussion paper is on understanding and responding to unsettled behaviour in infants. The authors have drawn on published literature; a round table consultation with expert stakeholders and representatives of key agencies; interviews with maternal and child health nurses; information from the public domain; and their own extensive experience working with parents and infants as practitioners and researchers in infant and family health and well-being.**

**At present there are divergent views about:**

- **the nature, determinants and severity of unsettled infant behaviour**
- **the most appropriate care to provide to parents seeking assistance to respond to it**
- **the clinical knowledge and skills required by health professionals to assist parents in this circumstance and the training needed to build these**
- **the human and other resources that health services require to address it**
- **the policies to govern these**
- **the research required to inform them.**

**The authors have described the available evidence about the nature, prevalence, determinants and consequences of unsettled infant behaviour, and the range of information and services that are currently available to parents in Australia. The evidence, debates and generally complex state of knowledge and practice are summarized. The aims of this paper are to contribute to: the development of nationally agreed principles and approaches to understanding and responding to unsettled infant behaviour to meet the needs of parents, infants and professionals; dissemination of existing knowledge, and formation of a research agenda to address knowledge gaps.**

# Contents

<b>Executive summary</b> .....	<b>4</b>
<b>Unsettled infant behaviour: Nature, prevalence and determinants</b> .....	<b>6</b>
What is unsettled infant behaviour?.....	6
What causes unsettled infant behaviour? .....	7
How common is unsettled infant behaviour?.....	11
Consequences of unsettled infant behaviour .....	12
<b>Information and services for parents about unsettled infant behaviour</b> .....	<b>20</b>
Information in the public domain .....	20
Services for parents.....	21
Information and training for professionals.....	24
Advice about understanding and responding to unsettled infant behaviour.....	25
<b>Consultations with professionals about understandings and responses concerning unsettled infant behaviour</b> .....	<b>39</b>
Roundtable consultation .....	39
Maternal and child health nurse interviews .....	42
<b>Discussion</b> .....	<b>45</b>
<b>Recommendations for developing consensus guidelines</b> .....	<b>47</b>
<b>References</b> .....	<b>49</b>
<b>Appendix 1: Participants in the roundtable consultation</b> .....	<b>58</b>

## **Acknowledgements**

In addition to the authors, the following people participated in the round table consultation and have commented on a draft of this paper: Dr Lisa Amir; Professor Bryanne Barnett; Dr Sarah Blunden; Mr Warren Cann; Ms Norma Cowan; Dr Pam Douglas; Ms Rae Lawry; Ms Pam Linke; Ms Maureen Minchin; Ms Anita Moorhead; Ms Nicola Quin; Ms Patsy Thean; Ms Helen Stevens; Ms Chris Thompson; Ms Leanne Raven and Ms Rae Walter. The organisations these people represent are listed in Appendix 1.

We are also grateful to the following members of the Women's Mental Health Group at the Centre for Women's Health, Gender and Society at the University of Melbourne who reviewed a draft of this paper: Ms Sara Holton, Dr Sonia McCallum, Dr Heather McKay, Ms Trang Nguyen, Ms Penny Rush, Mr Thach Tran, Dr Karen Wynter, Dr Yao Xu.

The contributions of the Maternal and Child Health Nurses (MCHN) who participated in the key informant interviews conducted by Dr Heather Rowe are very much appreciated.

The authors are especially grateful to Dr Meg Montague, who facilitated the round table discussion; Ms Sylvia Petrony who assisted in developing this discussion paper and Ms Alaina Vaisey and Ms Sara Holton for research and administrative support.

We are very grateful to the Australian Research Alliance for Children and Youth for their interest in contributing to practice, policy, knowledge exchange and research in this field who funded this project.

## **Authors' note**

In writing this paper, we have included the range of perspectives held by diverse stakeholders, including representatives of relevant disciplines: paediatrics; general practice; maternal, child and family health nursing; parent and infant psychiatry; clinical and health psychology; social work and health science. Contributors to the paper have backgrounds in clinical practice, research, policy and advocacy. We have described the evidence for different positions, but the paper does not purport to represent the views of particular organisations or individuals.

# Executive summary

Unsettled infant behaviours are common, have adverse consequences for the development of parental competence and confidence, and optimal family functioning, and can be difficult for clinicians to treat. There are diverse opinions about the most appropriate responses to unsettled infant behaviour reflected in divergent clinical recommendations and multiple self-help resources many not drawn from an evidence base. This discussion paper argues for the development of a set of nationally agreed principles and approaches leading to guidelines for responding to unsettled infant behaviours. These guidelines are needed by parents and health and welfare professionals who support families.

- Unsettled infant behaviour in babies up to twelve months can include:
  - prolonged and inconsolable crying
  - resistance to soothing
  - frequent night waking
  - waking after short sleeps.
- At least one in four families experience problematic infant crying and fussing behaviours.
- Up to one in three families experience a problem with infant sleep.
- While both behaviours usually become less common over the first twelve months of a baby's life, for some families they persist for much longer.

There are currently different views about:

- the nature, determinants and severity of unsettled infant behaviour
- the most appropriate advice to provide to parents seeking assistance
- the clinical knowledge, skills and training required by health practitioners
- the research that is needed to support practice and policy development in this area.

Parents with unsettled infants require skilled assistance in order to reduce adverse consequences which can include:

- diminished parental confidence and feelings of helplessness
- poorer mother-infant and father-infant relationships
- compromised maternal mental and physical health
- severe maternal exhaustion
- paternal feelings of depression, frustration, anger
- marital dissatisfaction and tension
- poorer quality infant care-giving
- the most serious adverse consequence, infant abuse.

It is agreed that attribution of the origin of unsettled infant behaviours to either parents or infants is unhelpful and less salient than the provision of evidence-based effective early interventions which benefit parents, infants and their relationships with each other.

Parents seek help from a range of health professionals in the infant's first year of life and unsettled infant behaviour is a common reason for repeated help seeking, with high costs to the health sector. They also seek assistance from self-help books, DVDs and websites. These sources include a wide range of views and opinions about the causes of unsettled infant behaviour and the best responses to it. The quality and reliability of this information, particularly in relation to its evidence base, effectiveness, safety and risk is often not readily apparent, contributing potentially to the application of unproven practices and confusion and uncertainty for parents.

Responses to unsettled infant behaviour can be grouped broadly into two positions on a spectrum. In the Intuitive Parenting position parents are encouraged to trust their instincts and respond to all unsettled behaviours with active comforting including rocking, 'wearing' the baby in a sling or pouch, holding, and suckling, including to sleep. The other position on the spectrum, Infant Behaviour Management, holds that unsettled infant behaviour causes significant problems for many families; is not usually attributable to organic illness or always readily explainable. In this approach, after excluding health-related explanations, parents are given active strategies to shape care-giving behaviours to reduce unsustainable sleep associations and provide supported opportunities for the baby to learn to settle to sleep, from which reductions in crying and fussing usually follow.

The breadth of views and lack of agreement, including among health professionals about the causes, consequences and appropriate responses to unsettled infant behaviour would be reduced by the development of nationally agreed guidelines. These would assist health professionals to provide consistent clinical care and parents to make informed choices.

Progress towards achieving consensus among key stakeholders can be advanced through the systematic dissemination of currently available evidence and a research agenda to address knowledge gaps. Professional development for health professionals and public education for parents will then assist informed decision-making about responding to unsettled infant behaviour.

The Australian Research Alliance for Children and Youth is well placed to lead progress towards national guidelines about responses to unsettled infant behaviour.

# Unsettled infant behaviour: Nature, prevalence and determinants

An infant is born into a family, a community and a culture. Parental care-giving practices are influenced by multiple intersecting factors, including parents' own experiences of being cared for in their families of origin. All parents acquire their care-giving skills in the context of the values and practices of their extended families and of community and cultural attitudes, beliefs and norms relating to appropriate parenting and feeding methods. In all communities, parents are influenced by advice from health professionals and by messages transmitted through the media. Parents of infants also enact their parental roles and family responsibilities in the context of their existing commitments to income generating work, social obligations and sometimes coincidental adversity. It is acknowledged that parents' perceptions of infant behaviour and health professionals' responses to help-seeking by parents will be governed by these circumstances. Nevertheless some infant behaviours are especially difficult for care-givers to manage and health professionals in Australia currently lack consistent evidence-based guidelines to inform their responses.

## What is unsettled infant behaviour?

Unsettled infant behaviour is the now commonly-used descriptor for behaviours in babies aged up to twelve months which parents are concerned about and can find difficult to live with and clinicians can find difficult to treat. Unsettled infant behaviours include prolonged episodes of crying; inconsolable crying; resistance to soothing; difficulties settling to sleep; waking after short sleeps, and frequent overnight waking.

### *Persistent and inconsolable infant crying*

Although crying is normal in infants, there is wide individual variation in the amount and intensity of infant crying and fussing in the first year of life (1). Diverse terms are used to describe problematic crying, including colic, fussing, infant irritability and excessive crying (2). It is often thought about as the upper end of a continuum in which infant crying is intense and prolonged and care-giver soothing strategies are ineffective. It is usually difficult to explain why persistent, inconsolable infant crying occurs (3). The Wessel definition of problematic infant crying and fussing (4) is widely used and provides a helpful conceptual structure (5). In this, a 'fussy' infant is described as an otherwise healthy, well nourished baby who has episodes of irritability, fussing or crying lasting for at least three hours a day and occurring on more than three days in a week. 'Seriously fussy' infants are those in which these episodes persist for at least three weeks. In the first three months of infancy intense, inconsolable inexplicable crying in otherwise healthy infants is often described as 'colic' (6). It tends to emerge within two weeks of birth and then to reduce when babies are three to four months old. Episodes of intense crying often occur in the late afternoon and evening, but can occur at other times of the day (7).

### *Poor infant sleep*

Babies do not necessarily sleep spontaneously when tired or sleep for as long as needed. Infant sleep problems are usually defined as difficulties with sleep initiation including crying when put

to bed or being dependent on suckling, rocking, being driven in the car or other associations to go to sleep. They also include difficulties with sleep maintenance including short daytime sleeps, frequent overnight waking, and resistance to re-settling if awake after a short sleep (8).

Unsettled infant behaviours which parents can find difficult to live with and clinicians can find difficult to treat include:

- prolonged and inconsolable crying
- resistance to soothing and settling
- frequent night waking
- waking after short sleeps.

The Wessel definition (4):

Episodes of irritability, fussing or crying:

- lasting for a least three hours a day
- occurring on more than three days in a week
- persisting for at least three weeks in 'seriously fussy' infants.

## What causes unsettled infant behaviour?

There are varied theories about why some babies cry intensely or fuss persistently and / or find it difficult to settle to sleep, and substantial research has been conducted to investigate underlying mechanisms. Much of it is methodologically limited by being cross-sectional and therefore unable to elucidate causal pathways, and by investigating small or unrepresentative samples, so has limited generalisability and findings are ambiguous (2, 9). Almost all the research evidence has been generated in high income and only a little from low income countries.

### ***Persistent and inconsolable infant crying***

Mothers most usually attribute infant cries to hunger (10) and the widespread contemporary clinical and lay advice to women to “feed on demand” may promote the notion that infants only cry when hungry. Crying is then commonly presumed to be secondary to gastrointestinal pain. However, formal investigation of gastro-oesophageal reflux in infants with persistent crying concludes that, while these might co-occur, reflux should not be regarded as causally linked to crying (11). Intolerance of cow’s milk or other food proteins ingested either via the mother’s diet and breast milk, or from infant formula, has also been proposed. The primary signs of food intolerances are vomiting, reddening of the skin if touched by the milk, itching, and blood-stained mucous in the stool. The infant can also fail to thrive. These signs and symptoms may be accompanied by crying, but crying alone is not a sufficient diagnostic sign of a food intolerance which can only be confirmed by response to elimination of the allergen from the diet (7). Lactose intolerance has also been implicated but its role remains uncertain (7). Gastrointestinal pathology is rarely found on clinical investigation, and is thought at best to ‘explain only a minority of cases’ (12-14). Parents may feel that the infant is experiencing emotional distress, separation anxiety or is depressed, particularly if the infant does not seem happy when not crying or sleeping, and there are few enjoyable interactions between infant and parent.

Infants are born with distinguishable variation in intrinsic characteristics or temperament, which exert significant effects on their interactions with the environment; especially care-givers (7, 15). Nine dimensions of infant temperament have been identified in comprehensive interview and observation rating studies of large samples of infants: motor activity; regularity of sleeping and feeding patterns; response to unfamiliar people or stimuli; ease of adaptation to change; intensity of emotional reactions; threshold to reaction; overall mood; distractibility; and persistence (15, 16). Infant temperament can be assessed using structured questionnaires. The Short Infant Temperament Questionnaire (17) for infants aged over 4 months is a 30-item standardized parent-completed scale. Validation studies have found significant correlations between the mother's and the maternal and child health nurse's independent assessments of infant temperament and a high consistency between scores when the test is administered more than once (17). Infants are more temperamentally difficult when they have little rhythmicity of sleeping and feeding patterns; are easily aroused; have difficulty in adapting to environmental change and react with great intensity.

Oberklaid et al. (15) found that of 240 infants aged between four and eight months, those rated by both their mothers and maternal and child health nurses as having a generally difficult temperament also had more colic, sleep disturbance, and excessive crying than comparison infants. White et al. (18) found that infants with 'colic' slept less, cried more and were rated by their mothers as having more difficult temperaments on the Rothbart Infant Behaviour Questionnaire (19) than comparison infants. They were also rated as crying more intensely and being more resistant to soothing when assessed in the laboratory by an occupational therapist blinded to colic status, providing "independent confirmation of maternal ...reports".

The relationship between infant crying and parent rating of infant temperament is however complex. A prospective study of a community-based cohort of infants found that those rated as having a difficult temperament at two weeks of age cried more at 6 weeks, but temperament only accounted for 7 percent of variance in total amount of crying (20). The Australian Temperament Project found that overall, more infants were rated as difficult at 7–8 months of age (16.3%) than had been at 4–5 months (9.6%) which does not conform to the normal crying pattern in infants which tends to peak in the first 3 months. This study found half of the infants rated as difficult were reported by parents to have had colic, but so were 20 percent of the infants who scored as easy on the temperament questionnaire (16). It is possible that these infant reactions reflect immaturity and difficulty in regulating reactions to novel experiences, including gastrointestinal sensations and unexpected noises rather than temperament *per se* (7).

Infants who are having less total sleep in twenty four hours than is average for their age tend to cry more and it is likely that some crying can be attributed to infant fatigue, perhaps accompanied by overstimulation if caregivers are unaware that their babies might need sleep rather than further stimulation (7, 21, 22). Parents may be encouraged to distinguish infant cries as indicating pain, hunger, a startle reaction or fatigue. However, there is little empirical evidence that these cries are in fact specific or distinguishable and in reality contextual factors are required to decode crying (10). In systematic investigations persistent crying has been found not to reflect pathological care-giving or an abnormal familial environment (14), but it has been hypothesized that parental care-giving practices might contribute to the maintenance of prolonged crying.

These practices are to some extent culturally determined and have been observed to vary in different settings. For example, Barr, Konner, Bakeman and Adamson (23) analysed observational data which had been collected by the Harvard Kalahari Research project in 1969 and 1971 about 46 infants and their mothers from the !Kung San ethnic group living in villages in

Botswana. Infants were held and carried (usually upright in a sling) for more than 80 percent of the time under observation, fed frequently (often 4 times an hour), and their cries or fretting behaviour were responded to immediately. Episodes of crying were brief, but increased in duration between the first and third months of life. Similarly in a study that compared infants in Manali, India with infants in London, Manali mothers reported an increase in crying from 2 to 6 weeks, but the duration of infant crying was only 10 to 20 percent of that reported by mothers in London. Manali mothers tended to respond immediately to the cries of infants, in contrast to the London mothers where approximately half delayed responding. Half of the Manali mothers reported that their baby cried 10 minutes a day or less at 6 weeks whereas at this age 39 percent of the London sample was reported to cry for more than 3 hours a day. The authors acknowledge that none of these data were confirmed with tape or video recordings and might reflect different reporting styles rather than absolute differences in crying duration (24).

A Danish community survey of 118 mothers of infants found a 3-week peak in mean total daily crying duration of 90 (SD=58) minutes in 24 hours which halved by 12 weeks to 48 (44) minutes. Crying duration at 3 weeks was reported to be lower than the two hour average in other industrialised countries and was interpreted as reflecting Danish mothers' prompt responses to infant crying and flexible, rather than structured approaches to caring for the infant. However, despite being held more than other infants about 10 percent of the babies cried for at least three hours a day (25). Hubbard and Van Ijzendoorn (26) found that the time to respond to an infant's cries in the first nine weeks of life did not predict how much babies cried in later weeks. In a comparison of groups of 50 babies receiving different care-giving strategies in London and Copenhagen, it was found that while total crying and fussing at 10 days and 5 weeks was less in the group who were held for longer, episodes of intense inconsolable crying were equally common across groups.

Overall these data are interpreted as indicating that while patterns of infant crying (bout frequency and episodes of unsoothable crying) appear to be similar across cultures, the total daily duration of crying in very early infancy might reflect different care-giving practices. The studies are not however regarded as definitive, first because comparisons were not between groups who were randomly allocated to different care-giving conditions; second, even when randomised prospectively to different care-giving groups parents do not always change their practices, and third, maternal reports are regarded as a less reliable measure of outcomes than observations conducted by a person who is blind to group allocation (27). Nevertheless the observations informed a randomised controlled trial in which families were allocated from birth to an intervention of increased carrying or a control group (28). The experimental group was asked to carry their baby in their arms or a sling for at least three hours a day. The total daily crying and the amount of evening crying were significantly less in the experimental group, but not the frequency of crying episodes. These findings were not however duplicated in two subsequent trials (29, 30). St James Roberts (27: 553) in an expert review concluded that while overall amount of crying might be reduced by care-giving behaviours, "unsoothable crying bouts are common and specific to early infancy, are not affected by parenting, and probably are the result of neuro-developmental changes that are a normal part of development".

It is also postulated that maternal anxiety and depression might reduce a mother's attunement to her baby and contribute to less responsive care, which might then lead to infant distress (31-36). Cross sectional data which find associations between maternal mental health problems and infant crying do not elucidate the direction of this relationship. The mother-infant relationship is reciprocal and dynamic and it is not possible to assert with confidence whether maternal depression precedes or is a consequence of excessive infant crying, or both.

## ***Infant sleep problems***

The causes of infant sleep difficulties are not clear, but frequent waking and resistance to settling often co-occur (37) and are regarded by some experts as early indicators of a more difficult infant temperament (38). There is evidence that infants with the temperamental characteristics of a low threshold to arousal; intense reactions to unfamiliar stimuli and high levels of motor activity are more likely to have poor quality and dysregulated sleep (39). Bayer et al. (40) reported in a survey of 692 Victorian mothers of 3 to 6 month old infants that, compared with 11 other variables tested in multivariate analyses, sleep problems were associated most strongly with the mother appraising her baby as having a more difficult temperament than babies in general (OR 10.99, 95% CI 4.31 to 28.02). Others argue that in general, temperament is regarded as having quite a small role in infant irritability (7, 41).

Infant sleep problems occur in a family context and might also be governed or moderated by parental care-giving (42). Breast milk is the preferred infant food and breastfeeding promotes both infant and maternal health. International guidelines to establish and sustain breastfeeding recommend that, especially in the early weeks of infancy as lactation is being established, mothers respond immediately to infant cues with frequent feeding at all times in a 24 hour period, a practice described as: "Breastfeeding on demand - that is, as often as the child wants, day and night" (43). This feeding routine accounts for the consistently observed pattern of shorter settled periods and later age of cessation of overnight feeds in breastfed than in bottle fed infants (27). Paradoxically, the continued parental sleep disruption associated with these guidelines is found to be an important reason for breastfeeding cessation (44). However, evidence that even very young infants can learn to adapt their behaviour in response to care-giving practices comes from two randomised trials of behavioural programs, for babies developing normally at 3 weeks of age, both of which aimed to increase the overnight inter-feed interval (45, 46). Parents in the program group were instructed to feed their baby between 10pm and midnight, settle the baby in the cot rather than while being carried, maximise differences between day and night and increase the intervals between overnight feeds. Whilst structured, the method did not involve parents behaving rigidly or leaving their babies to cry. In both trials, significantly more infants in the program group remained settled overnight at 12 weeks of age, and in the Pinilla and Birch (45) trial, took larger feeds on waking in the morning than in the comparison groups. Nikolopoulou and St James-Roberts (47) sought to establish early identifiers of infants at risk of disturbed sleep in a community cohort of more than 1700 infants born in one English county hospital. Babies, who had more than 11 feeds in 24 hours at one week of age, were less likely to sleep through the night at 12 weeks of age, than infants who had fewer feeds. Sadeh et al. (48) found that being suckled to sleep was associated with nearly three times the likelihood of the infant having a sleep difficulty (OR 2.81, 95% CI 1.80 to 4.41).

In addition to the contribution of feeding practices to infant night time waking and settling (27), other practices such as co-sleeping, rocking or cuddling to sleep and parental presence until the infant is actually asleep are associated with greater likelihood of sleep difficulties (7, 39). Burnham et al. (49) found that infants placed awake in bed were more likely to learn to self-soothe and to have longer continuous sleep periods. Infant feeding difficulties including refusal of breast or bottle, frequent small feeds and multiple overnight waking for feeds frequently co-occur with dysregulated sleep and persistent crying (50).

- Attributing the difficulties to either the infant or the parent is not necessary, rather the problem can be understood as a mother-infant dyad who are experiencing difficulties in establishing a gratifying mutual relationship.
- Parents who are experiencing unsettled infant behaviours all require support in order to avert problems in the development of parental confidence and a satisfying parent-infant relationship.

Oberklaid, 2000 (2)

## How common is unsettled infant behaviour?

Estimates of how common infant crying and sleeping problems are, vary by the definitions that are used and the baby's age (5, 51). St-James Roberts and Halil (52) conclude that about two hours crying in twenty-four is expected in early infancy.

Armstrong et al. (53) established in a community survey of more than 3200 Queensland parents bringing their children for routine health checks that 23 percent of three month old infants and at least a third (36%) of older infants had at least one difficulty with initiation or maintenance of sleep. Beebe et al. (54) surveyed a consecutive cohort of 75 mothers attending a clinic with their four-to-six-month old infants for routine health checks. Of these, 23 per cent reported that their infants cried for more than three hours per day. Frequent night time waking is especially common in infants aged four to twelve months. Hiscock and Wake (55) surveyed 738 mothers of older infants aged six to twelve months attending maternal and child health centres for routine care in Melbourne. Of these, 46 per cent reported that they were experiencing a sleep problem including co-sleeping, being dependent on suckling to go to sleep, prolonged time to settle, frequent overnight waking and prolonged crying associated with night-time waking and short daytime sleeps. Wake et al. (35) surveyed 483 systematically recruited mothers of first infants seven times in the first two years of their babies' lives, beginning two weeks after birth. Half the participants reported a crying and/or a sleeping problem on at least one assessment. Overall, 25.3 percent reported a problem at one point, 13.3 percent at two points and 6.4 percent at three points and about 5 percent of mothers reported more chronic difficulties. Many crying and sleeping problems fluctuate in infancy, demonstrated in this study as being apparent at one but not a subsequent assessment point.

- At least one in four families experience problematic infant crying and fussing behaviours.
- Up to one in three families experience a problem with infant sleep.
- Both behaviours usually become less common over the first twelve months of a baby's life but may persist for much longer.

In general crying and fussing behaviours can be problematic for at least one in four families but these problems become less common over the first twelve months of a baby's life as episodes of crying become less frequent (35). Overall up to one in three families experience a problem with infant sleep. Sleep begins to consolidate overnight with fewer night-time wakings over the first year of life, but more than a quarter of families experience ongoing problems with sleep in the second year of their children's lives (8, 53, 56). It is widely agreed that these unsettled infant behaviours are distressing for parents, are associated with help-seeking, and that the problem is real and requires an active response (27).

## **Consequences of unsettled infant behaviour**

Unsettled infant behaviour occurs in a family, social and health service context and is associated with altered and often problematic interactions in all these relationships. Infant crying is highly arousing to care-givers. Much contemporary infant care advice encourages parents to trust their intuition or instincts (57) and to provide infant care that feels appropriate. However, when caring for an inconsolable infant, and having a comfort repertoire that only includes feeding or unsustainable practices such as rocking, walking and carrying, parents can feel ineffective and helpless (32). Confidence can diminish rapidly and parents are less likely to experience interactions with their infants as pleasurable (54, 58). Parents of inconsolable infants receive less positive reinforcement from the infant, such as laughing or responding to soothing, and have greater exposure to the negative stimulus of infant crying. Prolonged infant crying has been shown to contribute directly and independently to deterioration in the familial emotional environment (1).

For most babies who cry persistently in early infancy there are no lasting physical or emotional health problems. It is suggested that for a sub-group of infants in particular those in whom intense crying persists over the age of three months and whose families are experiencing coincidental psychosocial adversity that it might be a marker for poorer child development. Later behavioural and emotional problems, hyperactivity and poorer cognitive development have been found in some children who had these difficulties as infants (59-62). However, there is inadequate evidence at present to determine whether these later problems develop from the crying and sleeping problems, parental care-giving or are an indication of persistent neuro-developmental problems (27).

### ***Unsettled infant behaviour and mothers' mental health***

If the baby is responsive and rewards the mother by quieting to her soothing, smiling, interacting, suckling easily, and developing along at least an average trajectory, the baby provides gratification and promotes self-esteem. In contrast, an infant who resists soothing, cries inconsolably, is difficult to breastfeed, or sleeps poorly, can be experienced as critical and unappreciative. Mothers of infants who cry excessively report significantly more parenting stress, less sense of competence and efficacy and that they do not experience their infants as a source of positive reinforcement compared with the other mothers. Excessive, inconsolable infant crying and resistance to comforting have been associated with earlier cessation of breastfeeding, frequent changes of infant formula, maternal irritability, poorer mother-infant relationship and heightened risk of infant abuse (1, 3).

There is evidence that unsettled infant behaviour and compromised maternal mental health co-occur. Cross sectional, cohort and case control comparisons have found higher rates of non-specific mental health morbidity (40) and symptoms of anxiety and depression (31-36) in

mothers of infants with unsettled behaviours compared to those whose infants are more settled. The direction of this relationship is however unclear.

The term “postnatal depression” is in wide use in public and private discourse (63). Brockington (64) in a review of postnatal psychiatric disorders concludes that women identified through screening as depressed actually have heterogeneous conditions including posttraumatic stress disorder, panic, phobic, obsessional and generalised anxiety disorders, adjustment disorders and depression. These are situation focused, disabling and often reflect adversity and Brockington asserts therefore that the label has limited value in research and clinical practice (63). Some argue that ‘postnatal depression’ in the mother leads her to have a flattened affect with less animated mother-infant interactions and reduced responsiveness to the infant, which then leads to unsettled infant behaviour (31, 34). Mothers with high trait anxiety or with an anxiety disorder, which is frequently co-morbid with depression (65, 66) might be hyper vigilant and intrusive in care-giving, contributing to an infant’s difficulty settling to sleep (67). Others postulate a more reciprocal and dynamic relationship in which unsettled infant behaviours reduce a woman’s confidence in her ability to parent, and increase the likelihood that she will feel anxious, depressed and frustrated in her interactions with the baby (32, 58, 68, 69).

Mothers of infants with unsettled behaviour also report poorer physical health than mothers of settled infant (40). Profound fatigue is widespread among mothers of newborns but is often normalized or trivialized, despite the adverse impact it exerts on normal daily functioning (70). Severe occupational fatigue is associated with prolonged or irregular working hours, particularly with early starting times and overnight work, which disrupts the circadian rhythm. It is especially problematic in highly mentally and emotionally demanding occupations in which there are inadequate rest breaks (71). Occupational fatigue has adverse effects on emotional, cognitive and physical domains and is accompanied by poor judgement, slower reactions to events, decreased skills, increased clumsiness, reduced concentration and vigilance, and impaired memory. Severe fatigue leads to increased irritability, agitation, reduced empathy and sociability, low mood, and a general loss of insight and self-awareness (71).

Together, the repetitive work of managing a household and caring for an infant cannot be completed by one person. Nevertheless, the prevailing stereotype is that only paid employment is defined as work. Many women seek to assume the increased workload singlehanded and to spare their partners who are ‘working’ (72). Severe exhaustion in mothers of newborns is not named as occupational fatigue, perhaps because of pejorative stereotypes that label them as ‘not working’ or ‘stay-at-home’. These stereotypes mean also that the domestic setting is not conceptualised or named as a workplace and consequently does not benefit from considerations of occupational safety, including responsibility for managing worker fatigue. Infant care is far more time-consuming than can be imagined and all other household activities are slower and more difficult to complete when caring simultaneously for a baby. It is not accurate to define the times when an infant is asleep as spare time, not only because there are invariably other household tasks to complete but also because there is no true freedom either to rest or to pursue leisure activities because of the essential primary responsibility for the baby (73). The tasks do not remit on weekends and, in general, women have much less leisure than had been anticipated. In the absence of a clear evidence-base to management of fatigue, it can be normalised, or responded to with advice that might be unproven, ineffective and difficult to implement including ‘sleep when the baby sleeps’ or ‘get more help’ (74).

Fatigue has been regarded as symptomatic of depression, but an alternative view is that it arises because the unpaid workload of mothering a newborn, especially one with unsettled behaviours, is severely underestimated (75). Dennis and Ross (76) found in a longitudinal study of 505

women who scored less than the clinical cut-off score of 13 on the Edinburgh Postnatal Depression Scale (EPDS) (77) at 4 weeks postpartum, that self-reported fatigue, having fewer than 6 hours sleep in a 24-hour period, and frequent infant crying were significant predictors of higher EPDS scores at 8 weeks. Lam et al. (78) undertook a follow up survey of 3 to 4 year old children whose mothers had participated in an intervention to reduce infant sleep problems when they were aged eight months. Depressive symptoms were assessed using the EPDS in their mothers and it was found that infant sleep problems preceded rather than were a consequence of maternal depression.

Small et al. (79) conducted a follow-up study of a sub-group of women who had participated in a state-wide survey when their babies were eight months old. Overall 45 women had scored in the clinical range on the EPDS in the survey and 12 to 18 months later were asked to reflect on their understandings of that time. They attributed their distress to having been unsupported, in poor physical health and extremely tired. In general, they did not find labelling of this experience as a psychiatric illness helpful.

Unsettled infant behaviour is the most common reason for women to seek admission to one of Australia's residential early parenting services. Ten surveys of consecutively-admitted groups of women attending these services have been published (32, 65, 66, 75, 80-85). These all used self-report psychometric questionnaires to assess mood and some also used structured diagnostic interviews. There was a high reported prevalence of EPDS scores more than 12 indicating probable depression, ranging from 33 percent (65) to 60 percent (32). In the three studies which used diagnostic interviews, McMahon et al. (82) found that 87 percent met DSM-IV criteria for an episode of major or minor depression since the birth of the baby; Phillips et al. (65) that 25 percent met criteria for a current episode of major depression and 31 percent for a current anxiety disorder, and similarly Rowe et al. (66) that 25 percent had an anxiety disorder and 27 percent major depression. Broader psychological distress was elucidated by Fisher et al. (75) and Rowe and Fisher (85), who found that most (91%; 69%) scored in the clinical range for occupational fatigue (POMS Fatigue-Inertia subscale >12). Oddy et al. (86) surveyed women 12 months after discharge from a residential early parenting service, of whom half attributed their distress during admission to difficult infant temperament and behaviour, fatigue, and inadequate practical support in their work of infant care and domestic tasks.

Overall therefore unsettled infant behaviour is associated with substantial maternal mental health morbidity and disability.

### ***Unsettled infant behaviour and fathers' mental health***

There has been less investigation of the associations between unsettled infant behaviour and father's mental health.

A qualitative investigation using in-depth interviews with 10 fathers of 'colicky babies' recruited through a website constructed an explanatory model that included the experience of infant crying as being in 'an abyss' that aroused both despair and frustration (87).

The more systematic studies have investigated first whether it is associated with increased feelings of depression. Smart and Hiscock (88) surveyed fathers and mothers who had brought their infants, most of whom were regarded as having severe crying or sleeping problems, to the Unsettled Babies Clinic at the Royal Children's Hospital, Melbourne. Prior to the first consultation 30 percent of the fathers had EPDS scores above 9, a range which suggests probable depression for community groups. Raiha et al. (89) compared parents mood in groups of families with infants who either cried persistently, or did not, using blinded ratings of

videotapes of interactions and standardized questionnaires. Fathers of infants with moderate or severe colic had more anxiety and expressed less joy and enthusiasm than fathers of infants without colic.

The second aspect of paternal mental health that has been investigated is the potential for frustrated, angry and abusive behaviours to be elicited by unsettled infant behaviour. Ellett et al. (87) concluded that exposure to prolonged infant crying contributed to increased irritability in fathers towards the baby. Parental anger and frustration are even more difficult to disclose to health care providers than sadness or depression. In the context of compromised impulse control, perhaps due to alcohol or substance abuse, or to coincidental adverse life events, infant crying is an established trigger for angry or abusive behaviours towards the infant (90). Fathers or stepfathers commit more acts of abuse against infants aged five to nine months than mothers (91). Psycho-educational strategies to reduce infant abuse in America prioritize education for parents about infant crying (91, 92). The US “Period of PURPLE Crying” program is specifically targeted to the prevention of the shaken baby syndrome (93).

### ***Unsettled infant behaviour and the parents’ relationship***

There has also been relatively little systematic investigation of the impact of unsettled infant behaviour on the relationships between mothers and fathers. Reduced relationship satisfaction is common following childbirth as couples adjust to changed dependency needs, altered expectations, new responsibilities and the challenges of renegotiating gender stereotypes about the division of household work and infant care (85, 94). Fatigue in mothers of newborns is especially problematic for those whose domestic workload is not shared and who have unsettled infants. Widespread notions that a man should ‘help’ his partner perpetuate the stereotype that it is her work, with which he is assisting, rather than their work which needs to be shared fairly (72).

Meijer and van den Wittenboer (94) examined prospectively the interactions between parenting self-efficacy and fatigue, and infant sleep and crying, in 107 Dutch couples adjusting to life with a first baby. Infant crying was found to be the main predictor of marital dissatisfaction and tension. Improvements in marital satisfaction were associated with increases in the father’s self efficacy in managing infant sleep and crying, suggesting that interactions between partners are optimized when the father is closely involved in the care of these more difficult infant behaviours. Raiha et al. (89) compared quality of relationships between groups of families with infants who either cried persistently or did not. Overall the couples’ relationships were of similar quality, but those whose infants had ‘colic’ were displaying less trust and affection to each other and were communicating with less clarity.

Overall these authors concluded that persistent unsettled infant behaviours could exert an adverse effect on the quality of interactions, capacity for mutuality and shared approach to problem solving between partners and highlighted the need for effective early interventions to include both parents.

### ***Unsettled infant behaviour and the parent-infant relationship***

Unsettled infant behaviour places great demands on parents’ capacity for emotional self-regulation and empathy. A parent who experienced sensitive, affectionate, calm parental care in her/his own childhood is more able to remain sympathetic, sensitive and responsive to the infant than a parent who had less optimal care. Sadeh et al. (48) and Hiscock (95) emphasize that

in addition to their own experiences of early care, parents' knowledge about and understanding of infant behaviour, caregiving skills, sense of competence and ability to establish and maintain limits, including in the context of infant crying are crucial. Sadeh et al. (48) argues that parental capacities to soothe and to maintain predictable routines, are closely related to development of infant sleep habits in the first year of life. However, these authors also acknowledge that poor infant sleep governs parental behaviours and is a significant adverse experience for a family. In addition, some parents are recovering from a difficult birth, including the distress of having been separated from their newborn baby or are experiencing breastfeeding problems (96), which may limit their personal resources to care for an unsettled infant.

Unsettled infant behaviour is associated in general with compromised parent-infant relationships including reduced affection, increased frustration and poorer quality care-giving (3). Lehtonen (97) asserts that the adverse effects (which include more distant relationships and less likelihood of having a subsequent baby) of "excessive crying on family life is a testimony to the compelling force of a behaviour otherwise regarded as benign". Raiha et al. (89) found that 'colicky' behaviours in the infant were associated with poorer quality interactions between both mothers and fathers and their infants, in particular by less warm vocalizations, fewer vocal exchanges between infant and parent and less eye contact, sensitivity and contingency of responses. The problems in father-infant interactions were worse than those in mother-infant interactions.

The most serious adverse consequence of unsettled infant behaviour is abuse, which contributes to morbidity and mortality. Although rare, head injuries in infants are a severe form of abuse and are most commonly inflicted by parents. Known formally as 'inflicted, non-accidental, or intentional head injury, the more widely known descriptor is 'shaken baby syndrome' (91). Although conceptualized as involving violent shaking of the baby, it also involves hitting the baby and dropping the baby into a cot or onto another surface (91). While deaths related to abuse are rare it is estimated in high income countries that 6.5 infants die per 100,000 births and non-fatal maltreatment is 150 to 2000 times more common than this (98) This head injury is associated with 13 to 30 percent mortality, and in long-term neurological problems in half the survivors. Infants are especially vulnerable to physical abuse, risks of abuse are higher for younger infants and inconsolable infant crying has been identified as a common trigger for abuse, especially in infants aged 3 – 4 months (90). Reijneveld et al. (90) investigated care-giving behaviours related to infant crying in more than 3000 Dutch parents of infants aged up to six months. They found that 6.5 percent reported having smothered, slapped or shaken their baby in response to prolonged crying. Risks were increased in families in which there was a non-biological parent, or a parent was unemployed or a recent immigrant. The data were not disaggregated by sex of parent. In an expert commentary on this research Sheridan and Wolfe (99), experts in forensic paediatrics, emphasize that abuse of infants always involves lack of empathy and poor impulse control and that infants cannot be positioned as having precipitated such catastrophic responses.

**Potential effects of unsettled infant behaviour** include:

- diminished parental confidence and feelings of helplessness
- poorer mother-infant and father-infant relationships
- compromised maternal mental and physical health
- severe maternal exhaustion
- paternal feelings of depression, frustration, anger
- partner relationship dissatisfaction and tension
- the most serious adverse consequence, infant abuse.

In general experts in this field propose transactional models in which both parent and infant factors interact in a multidimensional dynamic process, and that while the difficulties often originate in the infant, the behaviours are moderated through interactions with care-givers (49). Papousek (2001) concludes that:

*“Due to the impact of inconsolable crying on the mother and the family during a vulnerable period of postpartum adjustment, persistent crying may ...push the (mother-infant communication) system into vicious circles of dysfunctional interactions characterised by negative reciprocity and mutual build-up of distress ... (which) calls for close attention among ...professionals in order to identify, at an early age, those families who are in need of specialized intervention” (59).*

### ***Unsettled infant behaviour and help-seeking***

Infants who are described by parents as crying excessively have been shown objectively to cry more intensely and for longer periods than average infants and help seeking in this context is an indicator of fully expended coping resources (27). Unsettled infant behaviours, are very common reasons for mothers of infants to seek professional help, including from multiple clinicians and services (1, 2, 27, 39).

A cost burden analysis conducted in the United Kingdom found that the annual cost to the National Health Service of infant crying and sleeping problems in the first 12 weeks of life in 2001 was £65 million (100). Similar Australian data are not available but analysis of Australian Medicare data from 1993 showed that the use of health services by families in the first year after a baby’s birth is high. In that year, mother-infant dyads made a mean of 7.7 visits (3.5 for mothers and 4.2 for babies) to General Practitioners in the 6 months following birth, which is significantly higher than the 2.6 visits per 6 months for all Australians. Of all medical services provided to babies, 25 percent were provided by GPs and 25 percent by paediatricians (101).

Australian primary health care includes maternal, child and family health services, which are provided by community-based nurses free of charge to parents in local government areas in all Australian states and territories. A Victorian community survey of 173 infants and their families

found that these services are used by almost all families on average 14 times over the first year of an infant's life (102). The number of visits varies by region and model of service throughout Australia.

Goldfeld et al. (102) found that infants were taken on average to 36 health service visits of which 42 percent were to Maternal and Child Health Nurses. On average, four different health services were used and health service use was significantly greater in the first than the second six month of an infant's life. The families in Goldfeld et al.'s survey (102) reported that the most common reason for a GP visit (51%) was for an unwell child, but overall only 15 percent of total visits to either a GP or a Maternal and Child Health Nurse were associated with the infant's health. This suggests that most visits are for other matters including routine health checks, immunisation, information about infant health and development or problems with feeding, sleeping and unsettled behaviour.

In a recent community survey, 875 women with four-month-old infants attending immunisation clinics in five local government areas in Melbourne were asked about their use of health services since the baby's birth, infant behaviour and their own mental health. On average mothers reported having used 2.8 different kinds of health services, in addition to Maternal and Child Health nurses. Mothers who visited more than three different health services were significantly more likely to have infants who cried persistently, resisted soothing and slept poorly than women who visited fewer services (103). This is similar to data about families admitted to an early parenting service in Queensland for assistance with unsettled infant behaviour. Of the 51 mother-infant pairs (mean infant age 13 weeks), 27 (57%) had sought advice from more than three different health professionals prior to admission (104). Overall these findings indicate both a high need and the possibility that the professional responses that parents encounter are failing to meet these needs.

Australia's residential early parenting services (REPS), which offer brief admissions to mothers experiencing difficulties with infant care and postnatal mood disturbance, are unique internationally. Unsettled infant behaviour is the most common presenting condition for parents seeking assistance from these services. In Karitane, a New South Wales public access REPS, 96 percent of admitted infants had either feeding difficulties, periods of inconsolable crying or dysregulated sleeping, singly or in combination (105). Parents kept infant behaviour diaries prior to admission to Torrens House, an equivalent service in South Australia and the 23 infants woke frequently to have an average of seven milk feeds overnight and resisted being settled (81). Overall, 72 percent of the infants at the Riverton Centre in Queensland woke more than three times per night and 83 percent slept for fewer than two hours during the day (32). Don et al. (106) collected 24-hour infant behaviour charts from 109 mothers one week prior to admission to Tresillian Family Care Centre's Willoughby Unit in New South Wales. The infants cried and fussed for a mean (SD) of 3.6 (2.1) hours in 24 hours. Fisher et al. (22) reported on two groups of infants (n = 58 and n = 59) admitted aged 4 to 12 months to Masada Private Hospital Mother Baby Unit in Victoria and most had dysregulated behaviour including waking more than twice overnight (66%, 64%) rarely or never self-settling overnight (90%, 93%) and total daytime sleep less than two hours (55%, 78%). A third had feeding difficulties, including refusal of breast, bottle or solid foods or mothers had an insufficient supply of breast milk. The mothers of one of these groups and of a group of infants admitted to a public access REPS in Melbourne (85) completed 24-hour infant behaviour diaries and on average the babies cried or fussed for a mean (SD) of 2.5 (2.6) and 1.7 (1.6) hours respectively in 24 at admission. Diagnoses of gastro-oesophageal reflux had been made in 16 percent of the infants admitted to Torrens House and a third of those in both the Riverton and Masada MBU cohorts. Infant temperament was assessed using the Short Temperament Scale for Infants in three admitted cohorts (22, 82). The infants in each

of the two cohorts studied by Fisher et al. (22) were significantly less approachable, more irritable and more difficult than population norms at admission. The 72 first born infants in the study by McMahon et al. (82) were assessed after completing the Tresillian treatment program and were significantly more irritable and less manageable than 58 comparison infants recruited in the community, but differences with population norms were not tested. Mothers and infants are admitted for four or five nights to these services, which do not have psychiatric designation and are highly sought after, with waiting lists of up to ten weeks for admission (107).

Effective early interventions for unsettled infant behaviour can benefit parents, infants and their interactions and relationships and can prevent the development of later behavioural and emotional problems in children and adolescents (2). However parents in Goldfeld et al.'s (102) study reported that although they were satisfied in general with their health care visits, they were concerned about the inconsistency of information and service given by Maternal and Child Health nurses. In Victoria, the Key Ages and Stages Framework for Maternal and Child Health Services now includes an evidence-based approach for parents of infants with sleep and settling difficulties at the 8 month visit, but there are currently no primary care clinical practice guidelines about sleep and settling advice for parents of younger infants.

*Overall, attribution of the origin of early parenting difficulties to either parents or infants is less important than the provision of effective early interventions that benefit parents, infants and their relationships.*

Oberklaid (2)

# Information and services for parents about unsettled infant behaviour

When parents of infants with unsettled behaviour seek assistance, they are faced with multiple sources of information in the public domain and diverse clinical and complementary health services (see Figure 1).

## Information in the public domain

There are many information sources about infants, infant behaviour and infant care available in the public domain including websites, DVDs and self-help books.

The internet provides access to an extensive collection of information on unsettled infants from a wide range of organisations and individuals. Sources include State Government departments (108) service providers (109), organisations with a specific philosophical or expert position, for example Attachment Parenting Australia (110), SIDS and Kids Australia (111); professional associations, for example the Australian Association for Infant Mental Health (112), the Australian Government in partnership with researchers, for example the Raising Children Network (113), international websites, for example Zero to Three (114), the Period of PURPLE crying (93) and the Centre for Attachment (115) and expert peers, for example the Australian Breastfeeding Association (116).

Similarly self-help books are written by experienced parents (57, 117-121); experienced nannies (122, 123); clinicians (124-126); and clinical services (127, 128). Of these thirteen self-help books, none draws explicitly on the published literature by citing references in-text to support their recommendations and only four (57, 120, 121, 126) include a bibliography or list of sources. This suggests that the recommendations are primarily based on the observations and experiences of each author.

The Raising Children Network (113) and the Period of PURPLE crying (93) websites are explicitly derived from evidence, but other sites do not generally provide references to the sources for their recommendations. Within this breadth of resources, a wide range of views and opinions is expressed and it is difficult for a general audience, to gauge the quality and reliability of the information, particularly in relation to safety and risk, and whether or not it is derived from reliable evidence.

## Services for parents

A variety of peer-support and professional services is available to parents seeking assistance with unsettled infants.

### *Peer support*

The Australian Breastfeeding Association (ABA) offers a free call breastfeeding helpline which provides telephone counselling using volunteers who have breastfed at least one baby for at least nine months and undertaken the ABA breastfeeding counsellor training course (129).

### *Primary health care*

Primary health services including general practitioners and maternal, child and family health nurses are available to all families without referral. Private practitioners, some with professional qualifications in midwifery, maternal child and family nursing, mothercraft nursing and lactation consultants offer home visiting for assistance with breastfeeding problems and infant behaviour difficulties on a fee-for-service basis. Some of these practitioners also provide books, websites, DVDs and other parent resources and offer professional development as part of their service (130, 131).

Telephone help lines offer professional advice, for example in Victoria:

- Maternal & Child Health Line is a Victorian Government service operated through the Better Health Channel staffed by qualified maternal and child health nurses who provide callers with information, support and advice regarding child health, maternal and family health and parenting concerns. Sleep and settling difficulties are not listed as a specific topic on which advice can be provided (132) Parentline operates in most Australian states and territories as a confidential web, email and telephone counselling service which aims to support parents and carers of children for the cost of a local call. Counsellors are tertiary qualified, paid professionals who receive additional specialised training in parenting skills development at Parentline (133).
- Nurse-on-call is a phone service that provides immediate, expert, confidential health advice from a registered nurse, 24 hours a day, 7 days a week and access to interpreting services if required (134).

### *Secondary health services*

Specialist advice and treatment is provided by medical and allied health practitioners. Specialised Early Parenting Services, in the public and private health sectors in most states and territories, admit women and their families on medical or self referral. After telephone triage, families are offered day-stay or four- and five-night residential programs, fee-for-service home visiting services, or specific education and support programs.

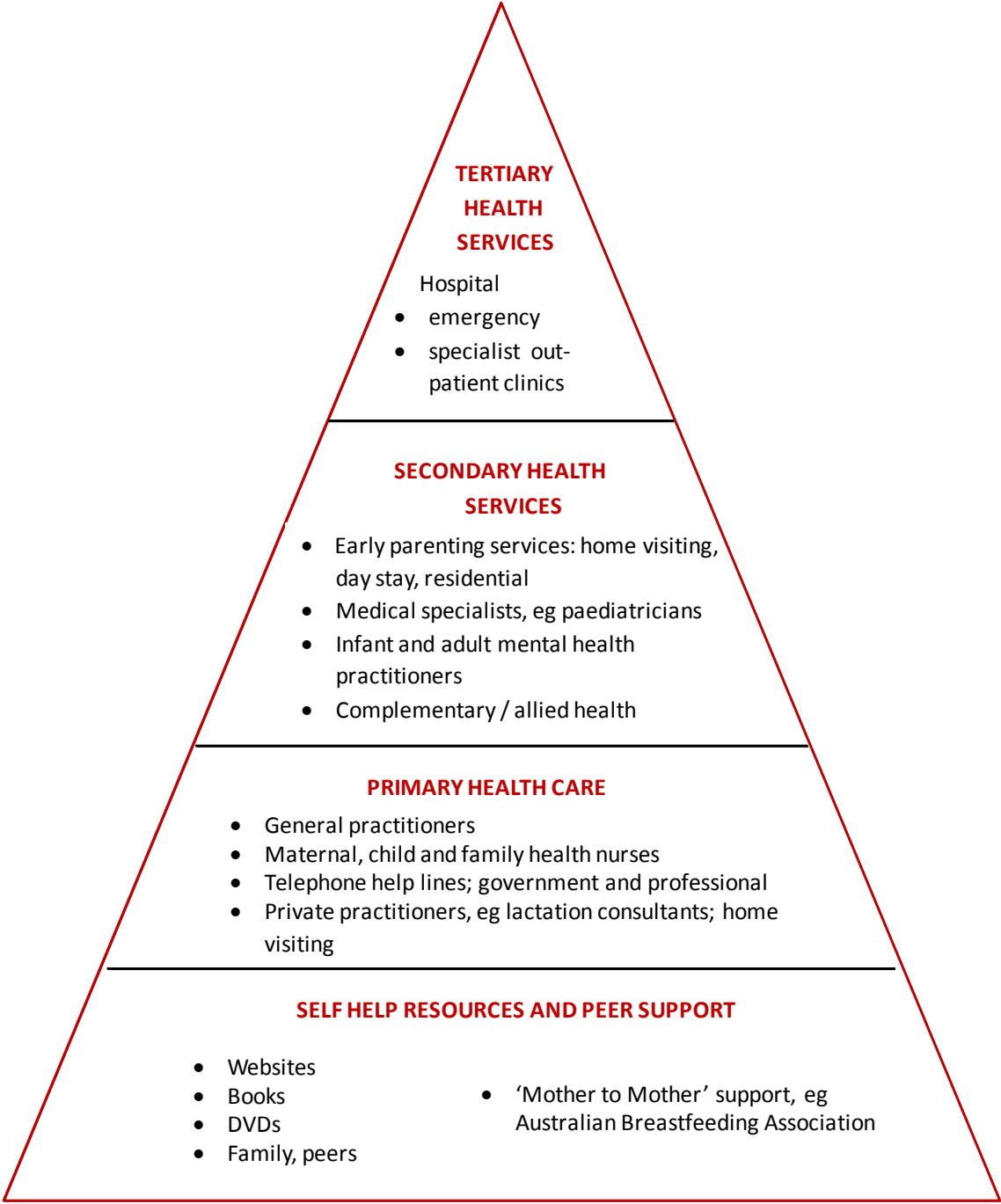
### ***Tertiary health services***

Specialist infant and child sleep clinics are available in some public hospitals. Distressed parents with unsettled infants are known to use Hospital Emergency Departments, but they are not specifically equipped to assist parents with these problems (103).

### ***Complementary health services***

Although rates of use of complementary health practitioners for assistance with unsettled infant behaviour are not known, clinical and consumer opinion is that these services are used frequently including chiropractic for alleged birth injuries that might contribute to unsettled behaviour and naturopathy for assistance with presumed allergy.

Figure 1: Parent resources



Source: adapted from Bromfield (135)

- Parents seek help from a range of health professionals in the first year of their babies' lives, many seek help repeatedly, and the costs to the health sector are high.
- Paediatricians, GPs, emergency departments, maternal and child health nurses, help-lines, early parenting services and complementary health services provide assistance.
- Parents also use self-help books, DVDs and websites. It might be difficult for parents to gauge the quality and reliability of this information, particularly regarding safety and risk.
- Available resources represent a wide range of views about the causes of unsettled infant behaviour and the best responses to it, which may be confusing for parents seeking help.

## **Information and training for professionals**

There appears to be little consistent pre-service education about responding to unsettled infant behaviour for primary care community nurses, who therefore gain an understanding of practice only during student placements. Some of the services for parents also provide in-service education for healthcare professionals and some private practitioners offer training based on their own practices. Early parenting services provide a range of training courses including about infant development and management of unsettled behaviour. The Australian Infant Mental Health Association and Parent-Infant Research Institute offer in-service professional education programs about parent-infant relationships for maternal and child health nurses. The distance and fees involved in attendance at these courses constitute barriers to participation for some primary healthcare professionals. Postgraduate training in infant mental health (Graduate Diploma and Masters levels) is available through the New South Wales Institute of Psychiatry and the University of Melbourne, Department of Psychiatry. Both these courses are available to professionals in other states through distance education. The Centre for Community Child Health, Royal Children's Hospital provided training about the program for parents of unsettled infants settling component of the 8-month postnatal visit as part of the implementation of the Key Ages and Stages Frameworks in Victoria.

## Advice about understanding and responding to unsettled infant behaviour

### Advice that is generally consistent:

- All approaches seek to enhance strong parent-infant emotional bonds, sensitivity and responsiveness to infant cues, pleasurable interactions and confident care-giving.
- It is normal and healthy for newborns to wake at night.
- Most babies will need their parents during the night for feeding and help with settling in the first six months of life.
- Infant crying is a care-eliciting behaviour.
- Babies do not cry to annoy or upset their parents.
- Most babies who cry inconsolably are not sick, but it is important to exclude a physical cause.
- Appropriate 'wrapping' can help settle a distressed baby (from birth to 4 months).
- Babies should be put to sleep on their backs.
- Sleep problems reduce and eventually disappear with time, but waiting for spontaneous resolution can take years and have adverse effects on parental wellbeing.
- A calm and safe family environment is beneficial for infants.
- If parents feel they are becoming irritable, the baby should be placed in a safe place and time should be taken to become calmer before resuming infant care.
- A baby should never be shaken: it can cause bleeding inside the brain and the consequent risk of permanent brain damage.
- It is important to seek help when a baby cries for prolonged periods and is difficult to soothe or will not settle readily to sleep.

Appraisal of the information and advice provided to parents seeking help in managing unsettled infant behaviour from these diverse public and professional sources reveals that while there is general agreement about some aspects, in others it can be contradictory.

In other ways, information and advice is varied, in particular in philosophy, principles and beliefs about the developmental needs of babies and appropriate infant care. These positions are often deeply felt and passionately advocated. It appears to us to be inevitable that this is potentially confusing to parents and probably to health and other care providers. The various positions can be regarded as occupying different points on a spectrum. For ease of description we have grouped these into two positions:

### ***The 'intuitive parenting' position***

On one point of the spectrum is the position which we have named 'Intuitive Parenting' (IP). This approach has parent and professional advocates.

The principles underlying this position and the recommendations made for infant care are that parents should follow their “intuition rather than a strict set of rules about when to breastfeed or when to respond to a cry” (110). Babies are believed to cry as a survival mechanism and a “baby's cry is her way of communicating to her parents that she needs something. If you are a parent trying to cope with a crying, fretful baby, you will know how distressing her prolonged crying is to herself, to you and to anyone nearby” (110). It is recommended that parents learn to read and respond to their baby's cries with active comforting including rocking and ‘wearing’ the baby in a sling or pouch. Babies are regarded as needing to be ‘parented to sleep’, not put to bed. “Some babies can be put down while drowsy yet still awake and drift. Other babies need parental help by being held and rocked or breastfed to sleep” (110). Waking overnight is regarded as adaptive and not to be discouraged.

*“Night waking in babies serves many healthy and protective functions. It allows frequent feeding and the intake of needed nutrition for growth; it creates the opportunity for emotional reconnection and stimulation of optimal brain development; and it is potentially protective against SIDS, allowing babies to avoid long periods of time in deep sleep that can leave them vulnerable...” (115)*

The practice of co-sleeping is encouraged, despite the diversity in the meaning of the term, because it represents “an integrated adaptive system”, protects maternal and infant health and promotes breastfeeding (136). While McKenna (136) acknowledges that there is controversy about whether co-sleeping is a protective or risk factor for Sudden Infant Death Syndrome (SIDS) he asserts that “babies should never sleep alone”, advice that directly contradicts public health messages regarding safe sleeping environments aimed at reducing the risk of SIDS (137).

In the IP position it is generally argued that infant sleep improves over time and that crying will reduce with active comforting strategies, which will in turn strengthen the parent-infant relationship.

Many professional advocates of infant-led responsive parenting are informed by Attachment Theory as articulated by Bowlby (138), Ainsworth (139), and psychodynamic theories about infant emotional development (140, 141). Bowlby (138) drew on ethology, the study of animal behaviour, to explain aspects of normal human development including development of the primary attachment relationship, usually with the mother. Attachment behaviours include sucking, clinging, following, crying and smiling, which are inborn behaviours that promote proximity to their caregiver, and are essential for the infant's survival. Attachment behaviours are activated by anxiety or distress in the infant, something frightening or threatening in the environment, or by movement away from or absence of the parent. Sensitive and responsive care-giving builds a secure infant–parent attachment relationship and promotes the conditions for optimal behavioural, social and emotional development, including a greater capacity for emotional regulation, positive social interactions and better coping skills. Bowlby described attachment behaviours as complementary to exploration behaviours. When attachment behaviours are activated, for example by fear, then exploration behaviours shut down. When an infant is close to the secure base of the parent, or feels safe or secure, attachment behaviours diminish and the infant is free to explore his/her environment (138)

From the Attachment Theory perspective, infant crying is regarded as a biologically based attachment behaviour designed to elicit parental care. Excessive crying or poor sleep are understood to be related to the dynamics of the infant-parent relationship. In this position, responses to unsettled infant behaviours need to be made on the basis of understanding the individual infant and family and the emotional meaning of infant behaviours, for example that

inability to go to sleep may reflect anxiety about being separated from the parent. Contextual factors, such as maternal depression or family violence, are seen as integral to the perpetuation of the infant crying or sleeping problems. In this approach it is acknowledged that parents' relationships with their own parents or psychological difficulties may impair their capacity to read and respond intuitively to their infant's cues. Attachment Theory holds that sensitivity and responsiveness are essential for the development of a secure infant-parent attachment. The risks for psychopathology associated with insecure attachments lead advocates of the IP position to be wary of approaches that are perceived to involve ignoring infant cries.

The 'authoritative knowledge' (142), or source of evidence for the IP position is predominantly personal and clinical experiences, informed by theories about parent-infant relationships, reports of care-giving practices in traditional societies, and the predictors of healthy parent-child attachment relationships but there is limited systematic evidence including randomised controlled trials of interventions for crying and sleeping problems, which are informed by these theories.

**Intuitive parenting strategies may include:**

- Encouraging parents to use their instincts rather than following strict rules.
- Interpreting the baby's cries and other cues in order to understand and respond appropriately to specific needs.
- Providing active comforting including rocking and 'wearing' the baby in a sling or pouch.
- 'Parenting' the baby to sleep, if required and for as long as the baby needs it.
- Co-sleeping with the baby, including sharing a bed, for as long as needed.

***The 'Infant Behaviour Management' (IBM) position***

Another position on the spectrum, commonly adopted by paediatric and early parenting services is that unsettled infant behaviour causes significant problems for some families; is not usually attributable to organic illness or always readily explainable, and might reflect differences in infant temperament. However, after excluding health-related potential explanations, this approach recognises that it is important to provide parents with active strategies to respond to it. In this position it is argued that infant behaviour can be shaped or modified by the care-giving environment. We have named this position Infant Behaviour Management (IBM). In this position it is assumed that knowledge about infant development and care-giving skills are learnt and can be strengthened. Infant Behaviour Management interventions include education for parents about infant development and capacities, the value of providing the baby with a predictable environment in which there are regular routines of care and ways of responding to the baby's crying that will shape the baby's environment and consequently their sleeping pattern. Authoritative knowledge in this position is informed by clinical experience, but predominantly derived from research evidence published in peer reviewed journals.

### ***Perspectives about what unsettled infant behaviour is***

Different positions offer different definitions of what constitutes problematic 'unsettled infant behaviour' and what the needs of babies and appropriate parental responses are.

The IP position advises parents to respond intuitively to the baby's crying, feeding and sleeping needs. It is acknowledged that continuing to feed babies through the night might be associated with more overnight waking than in other infants of a similar age. However, this is presumed not to be a sleeping problem but necessary because the baby needs to be fed. (110). Diversity in sleeping behaviours are thus characterised as 'normal' infant variation.

The IBM position is that if parents are seeking help for unsettled infant behaviour it is highly likely that the baby is crying more intensely and for longer than an average baby, is less likely to be having an optimal amount of sleep (27) and that these are problematic for parents and contribute to poor family functioning. The general principle is that "... it is a problem if it is causing distress in your family and is affecting how you relate to your baby during the day" (113).

### ***Perspectives about what causes unsettled infant behaviour***

It is difficult to identify from the resources available whether the IP position identifies any infant behaviours as problematic. Infant crying and frequent waking are regarded as care-eliciting behaviours that require soothing and comforting care-giving responses. The IP position regards crying and sleeping problems as being caused or perpetuated by disruptions in the infant's emotional regulation or the infant parent relationship (143). Hofacker and Papousek (143) describe how "the infant's self-regulatory competence in different domains (feeding, sleep-wake organization, affective arousal and attention, motor control, integrative processes, communication) develops within the context of the parent's intuitive co-regulatory support". This intuitive parenting, consisting of sensitive reading of infant behavioural cues and fine-tuned responsiveness, compensates for the infant's maturational constraints, and facilitates the infant's emerging self-regulatory competencies. Psychological vulnerability and psychosocial adversity can disrupt this process and lead to infant behaviour problems.

The "Infant Behaviour Management" position identifies, within a framework of physical and cognitive developmental stages, what might contribute to problematic infant behaviour and these in turn guide the type and timing of interventions (113). It is acknowledged that crying is normal in infants and that there is wide individual variation in the amount and intensity of crying and fussing in the first year of life and that problematic crying is conceptualised as the upper end of a continuum (3). Excessive crying occurs in 10 to 30 per cent of infants in the first three months of life (54). Frequent overnight waking, resistance to settling and problematic crying frequently co-occur (37). Usually originating in the infant, caregiver behaviours can contribute to the maintenance of unsettled infant behaviours (108). It is acknowledged that "Sometimes, and in some cases often, babies cry for no apparent reason" (113) and also that some parents find even brief episodes of infant distress difficult to tolerate.

In this position babies aged two to twelve months are generally expected to sleep a total of 9-12 hours at night and up to four hours during the day. Even during the infant's first six months of life, parents can help babies develop healthy sleep patterns and reduce the chances of settling and waking problems arising in the future by their care-giving practices. Once babies are six months old, they do not need to be fed during the night and offering overnight milk feeds is associated with continued overnight waking. At around six months, babies have cognitive capacities to remember that things exist, even when they're out of sight and this can affect

sleep. This means that if babies wake during the night, they might call or cry out because they know that their parents are available to come to them. Overcoming worry about being separated from parents during the night at 6-12 months is a normal and necessary maturational step for all children (113).

### ***Perspectives about how common unsettled infant behaviour is***

The IP position as articulated by parents is that about 1 in 10 babies will wake 3-4 times a night and by eight months, 60-70 percent of babies are able to self-soothe back to sleep without a parent's help (110). However at least 30 to 40 percent of parents will still be providing overnight infant care and therefore be unable to have uninterrupted sleep themselves. These patterns are not necessarily positioned as problematic or warranting professional or other assistance. Professional advocates of IP do believe that parental concern about crying and sleeping behaviours warrant professional assistance.

The IBM position is that more than a third of parents report problems with their baby's sleep at some point in the first two years of life and for many parents the consequences of interrupted and insufficient sleep are disabling (113).

### ***Perspectives about the consequences of unsettled infant behaviour***

The IP view is that crying is the way babies communicate their needs to their parents. The mechanism by which a parent learns to interpret the meaning of infant cries is less clear, but intuition and past experience are emphasised by parent advocates. To this end, most advice is to seek help from other mothers either through self-help books, DVDs, web-based resources or peer-based telephone lines, for example the Australian Breastfeeding Association, (116).

In the IBM position, it is argued that tired babies are irritable, less likely to feed well and can be more difficult to care for. Parents can be seriously fatigued and experience anxiety, irritability, reduced capacity to manage day-to-day responsibilities and interpersonal difficulties including in interactions with the baby (113). The presumption that crying always indicates hunger and therefore that the best response is to offer the breast or bottle, tends not to be effective in the longer term. When feeding is not effective, parents can use an increasing range of strategies to avoid the crying like driving, walking and rocking and anxiety can increase.

### ***Perspectives about responding to unsettled infant behaviour***

Reflecting the value placed on parent intuition, the recommendations for responding to unsettled infant behaviour from the parent advocates of the IP position are quite general and non-specific. For example "...the truth is that no matter how tired, stressed, uncertain or inadequate you feel, you *do* know your baby best. So listen to your heart and listen to your baby" (57). It is emphasised that intuitive parenting does not involve leaving the baby alone in order to learn how to "self-settle" in any circumstances (110). When babies do wake or cry the adult needs to respond to the need by settling them back to sleep using various strategies, such as suckling, rocking, carrying and co-sleeping (144).

Stevens and Davenport (130) in their 'Safe Sleep Space' approach claim that:

*'families reach sustainable change in a loving, informed way. The strategies involve responding appropriately to individual baby cues and communication, and therefore accommodating individual baby responses, temperaments and behaviours. With this in mind, no controlled crying is required to achieve good sleep patterns'.*

Therapeutic approaches consistent with Attachment Theory and oriented more toward IP tend to be individualized, focused on the infant parent relationship or parent and infant states of mind as the target of change rather than focused on trying to modify the infant's behaviour, These may focus on the interactive behaviours alone (145, 146) or have a multifaceted approach of targeting both interactive behaviours and infant/parent states of mind (143, 147) .

Jordan et al (147) allocated 127 infants admitted to a tertiary paediatric hospital in Melbourne for persistent crying of on average four hours a day randomly to receive anti-reflux medication, placebo medication or an infant mental health intervention. This mental health intervention involved a 90 minute detailed consultation with two infant mental health clinicians focusing on infant experience and emotional development; mother–infant interaction and attachment; parental emotional factors; patterns of crying and the potential impact of previous therapeutic interventions (e.g. weaning from the breast, multiple formula changes, or behaviour management regimes in the neonatal period). The infant's emotional development and interactive capacities were observed. Based on this assessment an individualized parent and nursing care plan was developed with the aim of helping the infant to feel more secure, anticipate a consistent response to distress, develop a greater sense of autonomy and have more opportunity for enjoyable interactions. There were no between group differences in average amount of crying assessed four weeks later, but the rate of subsequent admission to early parenting centres or mother-baby psychiatric services hospital was lower ( $p < 0.04$ ) in the group that received this intervention than the other two groups. Overall 27 percent of mothers were still scoring in the depressed range ( $>12$ ) on the EPDS at the completion of the trial.

Van den Boom (146) completed an intervention trial with 'lower-class' mothers of infants identified on the Neonatal Behavioural Assessment Scale (148) as irritable in the first two weeks of life. The three month long intervention initiated when the infants were six months old involved regular two hour home visits with an expert psychologist which focused on promoting maternal sensitivity and responsiveness. Baseline and outcome assessments involved highly detailed observations documenting infant and maternal behaviours in 6-second periods over 40 – 80 minutes and videotaping of caregiving activities. Mothers in the experimental group were more responsive, stimulating and controlling of their infant's behaviour compared to mothers in the comparison group and the infants were more sociable, cognitively sophisticated, explored more and cried less than control infants. At one year of age, two thirds of the intervention infants, compared with just over a quarter of the control irritable infants, demonstrated secure attachment to their mothers (146). Between group differences in maternal psychological functioning were not assessed or reported.

Hofacker and Papousek (143) from the Munich Interdisciplinary Research and Intervention Program clinic use a model of interaction-centered, infant–parent psychotherapy to target dysfunctional patterns of mother/ parent–infant communication. The aim is to restore parents' intuitive capacities by facilitating pleasurable parent-infant interactions. The focus is on assisting the infant to initiate an interaction or respond with positive feedback cues such as visual attention, smiling, cooing, cuddling, settling to sleep, or interest in eating instead of displaying negative feedback such as gaze avoidance, fussing, crying, back arching, fighting against falling

asleep or food refusal. Multiple interventions are provided depending on the nature of the presenting problem and can include maternal psychotherapy, physiotherapy and in-patient admission because of risk of child abuse and neglect, in addition to interaction-focused sessions. Prospectively evaluated outcomes, reported as 'global clinical evaluations' were that 68 percent of parents reported improvements, after a mean of 4.2 sessions, with 59 percent of patients being discharged after 3 sessions (143). None of these studies discuss the economic costs and benefits of their approaches or the implications for scaling up the approach for population-based interventions.

The IBM approach is more structured and solution-focused. It presumes that parents have ranges of: knowledge about a newborn's developmental capacities, parenting skills and sources of support. Parents may also have competing demands on their time from paid and unpaid work, caring for other children, or other co-incidental commitments and that a structured approach offers practical strategies. IBM strategies involve recommendations based on presumptions that babies can, with support, learn how to self-soothe and return to sleep independently when they wake up and that well-slept babies cry less than those who under-slept (113). They also recommend appropriate parental support while the strategies are implemented. The strategies all include education for parents about normal patterns of crying and sleeping over the first year of life. The IBM approach is informed by evidence generated in randomized controlled trials which included women from a range of socioeconomic and cultural backgrounds (7, 56, 95, 149, 150).

The IBM approach informs care in paediatric practice, specialist paediatric hospital clinics and early parenting services. In broad terms this approach involves teaching and coaching parents in individualized age-specific strategies to foster more settled infant behaviour. These aim to assist families to establish a sustainable daily "feed, play, sleep" routine of daytime care. Strategies to promote sleep include educating parents about infant sleep needs, states of sleep, sleep associations and recognition of behavioural cues of tiredness. Unsustainable sleep associations including suckling, rocking, walking and being carried are reduced, and more sustainable ones like a wrap or sleeping bag and predictable settling routines are promoted. Mothers are shown how to identify infants' behavioural signs of tiredness for example eye-rubbing, ear-pulling and persistent grizzling occurring after the baby has been awake for one-and-a-half to two hours. Babies are put to bed while still awake, and structured low stimulus comfort (e.g. rhythmic 'heart beat' patting, gentle body rocking) without making eye contact are provided until the baby is quiet. The infant is put to bed in a room that is dark and there are minimal distractions in or over the bed. It therefore comes to be recognized as a safe sleeping place, and there are no confusing cues marking it as a place for play. Infants who wake after a single sleep cycle of 40 – 50 minutes are re-settled to sleep using the same comfort strategies, without being lifted from bed. Babies over six months of age are offered independent opportunities to practise going to sleep for two minute, progressing to four and six minute-intervals with adult reassurance at each interval (149, 151, 152). Parents who feel unable to leave the room are encouraged to sit in a chair near the baby until s/he is quiet and then to move the chair progressively towards the door until the baby settles without parental presence.

**Infant behaviour management strategies** may include:

- Teaching parents about normal infant developmental stages and how to recognize and respond to tired cues.
- Separating feeding from sleeping.
- Putting the baby to bed while awake rather than asleep.
- Reducing unsustainable sleep associations.
- Using rhythmic patting to quieten the baby.
- Providing the baby with short opportunities to learn to self-soothe.
- Resettling the baby to sleep if s/he awakens after one sleep cycle.

This approach has been tested in randomised controlled trials. Hiscock and Wake (149) identified mothers whose eight-month old infants had sleep problems through systematic screening at routine hearing assessment clinics. Of the 738 women who were screened, 156 of the 232 who were eligible agreed to participate and 78 were assigned by stratified randomisation according to the mother's depression status to routine care and 78 to receive the intervention. It involved three individual consultations with a paediatrician about IBM sleep and settling strategies. Sleep problems resolved in 69.7 percent of the intervention and 47.6 percent of the control mothers ( $p < 0.001$ ) in the 'non-depressed' groups and by 78.7 percent and 39 percent in the 'depressed' groups (EPDS score  $> 9$  at randomisation). There were larger reductions in maternal depressive symptoms in the intervention than the control group by two months and in the 'depressed' sub-group also at four months post-intervention and there was a reduced use of other sleep services. This was followed by a cluster randomised trial involving random allocation of maternal and child health centres in six local government areas to test whether a similar intervention could be delivered by specifically trained maternal and child health nurses. Outcomes were assessed in a sample of 328 mothers who had identified a sleep problem in their seven-month-old infants. Prevalence of infant sleep problems was lower in the intervention than control group at 10 months (56% versus 68%; adjusted OR 0.58, 95% CI: 0.36 to 0.94) and 12 months (39% versus 55%; adjusted OR 0.50, 0.31 to 0.80). Maternal mental health measured both by the EPDS and the SF-12 was significantly better in women in the intervention than the control clusters at three and five months after the intervention (150). Mothers had attended for an average of 1.52 visits which lasted about 25 minutes (56). Mothers found information about normal patterns of infant sleep, sleep associations and putting babies to bed awake particularly helpful (149). Importantly a comparison of the economic costs of program design and implementation, and use of professional health care for sleep advice revealed that less had been spent on those who received the intervention (£96.93) than the control condition (£116.79) (150).

There has also been a series of studies which have followed women and their infants up after they have completed residential programs in one of Australia's early parenting services. Unsettled infant behaviour is an admission criterion for these services and mental health problems in their mothers are prevalent. The programs vary, but all use supported individualised training in infant sleep and settling strategies while promoting maternal sensitivity and responsiveness to infant cues (152). As summarised in Table 1 there is consistent evidence of improvements in maternal mood and reductions in infant sleep difficulties and / or crying and fussing behaviours one month post intervention, which are sustained at three and six months.

None of the studies had a comparison group of mother-infant dyads who did not receive the intervention, but the consistency of the results suggests that the intervention is effective.

<b>Authors, date, setting</b>	<b>Study sample</b>	<b>Intervention</b>	<b>Outcome measures</b>	<b>Findings</b>
Leeson et al 1994 (81) Torrens House Adelaide, South Australia.	Consecutive cohort of 20 mothers admitted with infants aged 8-12 months	Four night structured residential psycho-educational program	Assessments of maternal mood using CES-D five nights prior to admission and at 1 and 3 month follow-up	Reduction in maternal CES-D <sup>#</sup> scores > 16 from 70% to 10% one month post-discharge, maintained at three months (p < 0.001)
Armstrong et al (2000) (153) Riverton Centre, Brisbane, Queensland	Consecutive cohort of 51 mothers with infants aged on average 13 (4 – 28) weeks; 48 (94%) followed up	Four night structured residential psycho-educational program	Assessment of maternal mood using EPDS* at admission and 3 month follow up	Reduction in mean EPDS* score from 16.5 to 7.2, proportion with EPDS scores > 12 reduced from 86.2% to 18.8% (all p<0.001)
Fisher et al 2003 (154) Masada Private Hospital Mother Baby Unit, Melbourne, Victoria.	Consecutive cohort of 81 mothers with infants aged on average 23 (± 14.4 weeks); 86% followed up	Five night structured residential psycho-educational program	Assessment of maternal mood with the EPDS and the Profile of Mood States; study-specific self-ratings at admission and one month after discharge	Reduction in mean EPDS scores from 12.3 to 6.6, proportion with EPDS scores > 12 reduced from 43% to 13% (all p < 0.0001). Reduction in PoMS Tension-Anxiety ≥ 20: 26% to 3%; Fatigue – Inertia ≥ 13: 78% to 32%. Insufficient sleep 78% to 11%; Confident about infant care 28% to 46%. All changes p < 0.001
Matthey et al (2008) (83) Karitane Residential Parentcraft Unit, Sydney New South Wales	Consecutive cohort of 116 mothers with infants aged on average 39 (3 – 156) weeks; 87% followed up at five and 75%	Five night structured residential psycho-educational program	Assessment of maternal mood with the EPDS and the HADS-A at five and sixteen weeks after discharge	Reduction in mean EPDS scores from 10 to 6.8* to 5.2; proportion with either EPDS scores > 10 or HADS-A <sup>^</sup> > 8 reduced from 55% to 30%* to 26% (all *p < 0.001)
Treyvaud et al (2009) (84) Queen Elizabeth Centre, Melbourne, Victoria	44 volunteers who were admitted with their infants aged 13. 6 (± 9.3) months; 75% followed up at four weeks	Five night structured residential psycho-educational program	Maternal mood assessed with DASS twice during admission and four weeks after discharge	Reduction in mean DASS <sup>‡</sup> Depression scores from 8.0 to 3.9*; Anxiety scores 4.2 to 1.7* and Stress scores 14.4 to 6.7* (all *p < 0.001)
Rowe 2010 (155) Tweddle Child and Family Health Service, Melbourne, Victoria	Consecutive cohort of 79 mothers with infants aged on average 33 (±14.8 weeks); 84% followed up at one and 73% at six months	Three or four night structured residential psycho-educational program	Assessment of maternal mood with the EPDS and the Profile of Mood States; study-specific self-ratings at admission and one and six months after discharge	Reduction in mean EPDS scores from 11 to 6.8* to 6.3 proportion with EPDS scores > 12 reduced from 39% to 18%* to 12%*. Reduction in PoMS <sup>+</sup> Tension-Anxiety ≥ 20: 20% to 8%* to 7%; Fatigue – Inertia ≥ 13: 69% to 43%* to 35%. Insufficient sleep 80% to 14%* to 12%; Confident about infant care 85% to 94%* to 96%. All * changes p < 0.001

<sup>#</sup> Centre for Epidemiological Studies – Depression Scale (Radloff, 1977)

\* EPDS (Cox, et al., 1987)

<sup>^</sup>Hospital Anxiety and Depression Scale (Zigmond and Snaith, 1983)

<sup>‡</sup>Depression, Anxiety and Stress Scale (156)

<sup>+</sup>Profile of Mood States (McNair, Lorr and Droppleman, 1981)

### ***Long term follow up after interventions to address unsettled infant behaviours***

There are relatively few follow up studies on which to base conclusions about the long term consequences of use of early interventions to assist families whose infants have unsettled behaviour. When the children were aged five to eight years Brown, Heine and Jordan (62) reassessed 59 percent of the families who had participated in the trial comparing an infant mental health intervention and anti-reflux medications. The children had significantly more behavioural and emotional problems than those reported for the general community and these limited family activities. The authors conclude that the subgroup of infants with severe persistent crying do not 'grow out of it', and that it might be an early indicator of vulnerability to developmental problems in children. They did not report whether these outcomes varied between the original treatment groups.

Controversies remain however about the potential long term harms of using infant behaviour management techniques. The IP position suggests that there might be long term harmful consequences to the infant and the parent-infant relationship, in particular that future mental health and relationship capacity are compromised (157). Critics of the IBM approach, for example The Australian Association of Infant Mental Health (AAIMH) argue that:

*"Many infants and parents sleep best when they sleep together. There is no developmental reason why infants should sleep separately from their parents, and in most parts of the world infants do sleep with their parents or other family members, either in the same bed, or in a cot next to the parents' bed". (158).*

If behaviour management is to be used to respond to unsettled infant behaviour, AAIMH recommends that it would be

*"...most appropriate after the child has an understanding of the meaning of the parent's words, to know that the parent will be coming back and to be able to feel safe without the parent's presence. Developmentally this takes about three years. This varies between children so observing children and responding to their cues is the best way to assess when a child feels safe sleeping alone" (158).*

They recommend that a full professional assessment of the child's health, and child and family relationships should be undertaken before initiating an infant behaviour management program. If an infant has already experienced separation from a parent due to sickness, parental absence or adoption, or if he or she becomes very distressed, the method should not be used.

Lam, Hiscock and Wake (78) followed up the participants in the Hiscock and Wake (149) community randomised trial when the children were aged three to four years and 73 percent responded. Overall, 32 percent of children had either a recurrent or a new sleep problem including frequent overnight waking and needing an adult present in order to go to sleep. Children with sleep problems had more behaviour problems than those without sleep difficulties, but family functioning was similar. Mothers of children with sleep problems had significantly lower mood than mothers of children without these difficulties, but this was not predicted by maternal symptoms when their children had been infants. The authors concluded that the sleep problems precede rather than are a consequence of maternal depression. There were no differences between child behaviour or maternal mental health between those who had or had not received the intervention. Participants

in the cluster randomised trial (150) were also followed up, this time when their infants were two years old (56). Mothers who had received the intervention were significantly less likely to report EPDS scores > 9 and >12. The mean EPDS score was lower in those who received care in the intervention than in the control maternal and child health centres. They recalled the intervention as having had beneficial effects on their relationship with the child. Fewer reported child sleep problems, but this difference was not significant. There were no differences between groups in child behaviour problems or parenting practices suggesting that there were no long term adverse consequences of the use of these strategies for children or the parent–child relationship.

The Raising Children Network concludes that:

*“Follow-up studies have shown that babies who have undergone controlled comforting are more likely to sleep better in the short term and are as well adjusted as their peers in terms of behaviour and sleep in the long term. Despite concerns about potential harms to the baby, no studies have shown any psychological or physical harm from using the behaviour management techniques described here” (113).*

However, there is inconsistent advice about what age to use these infant behaviour management interventions. Although they are recommended by the Victorian Government Department of Education and Early Childhood Development (DEECD) and are included in their Guidelines for Maternal and Child Health Nursing Practice as being evidence-based and non-harmful, they are only recommended for babies with sleep problems at the 8-month check-up (159). However the DEECD website refers parents to the Royal Children’s Hospital web-site for additional information and the recommendation on this site is that they can be used from six months of age (160). The Murdoch Children’s Research Institute parents’ pamphlet *Managing sleep problems in babies, 2008-2010* (for babies over 6 months) is provided as part of the DEECD training package for MCHN (159). Nevertheless, these problems are most common in younger infants and parents of infants aged up to six months also need advice even if it is different to that given to those with older babies and toddlers. It is not always clear from available information which age group the advice is meant for as demonstrated in The Children’s Hospital at Westmead ‘Crying baby’ factsheet (161) which provides 2 pages of advice under the heading “What to Do”, but no age-specific information.

There are overall few follow-up studies, and none regarding the consequences for breastfeeding or security of attachment as assessed with gold-standard observational measurement. While infant behaviour management strategies are effective in reducing problematic crying and promoting sleep and settled behaviour (159), they arouse divided views among clinicians, health educators, professional organizations and consumer advocacy groups. Implementation of universal training in infant behaviour management for professionals is constrained by these contested positions. This controversy is difficult for parents to evaluate and to apply.

### ***Ambiguous terms and their implications***

The use of non-specific language in this field is potentially problematic because meaning is open to a range of interpretations and emphases, including:

#### *Attachment*

This term is widely used by professionals, advocates and to some extent parents when discussing unsettled infant behaviour. Proponents of Attachment Theory differ from “Attachment Parenting” advocates in recognising that ‘intuitive’ responses to an infant will reflect a parent’s own experiences of attachment relationships and thus may not necessarily be sensitive to the infant’s needs. A parent who has experienced dismissing or ambivalent responses to their own dependency needs or at worst neglect and abuse may have impaired capacity to read and respond appropriately to infant communications. ‘Attachment Parenting’ is a term that may be used by advocates of particular approaches to care-giving, that emphasise security and proximity, one aspect of the attachment system, rather than exploratory behaviours (110).

#### *Co-sleeping*

Proponents of intuitive parenting encourage skin-to-skin contact, ‘wearing’ the baby and a family bed in which babies and parents sleep together. There is a critical difference between bed-sharing and having the baby in a separate cot in the parents’ room, but these two are sometimes conflated under the term co-sleeping. Attachment Parenting Australia claims that babies who co-sleep with their parents, including sharing their parents’ beds do not have a higher risk of Sudden Infant Death Syndrome (SIDS) (110). However this advice is contrary to that provided by SIDS and Kids Victoria (137) and the SIDS and Kids Australia (111). They recommend a separate sleep space, defined as having a baby sleep in her/his own cot or bassinette in the same room as the parents for the first 6-12 months; and that having a baby in an adult bed may be unsafe because of risks of entanglement in adult bedding, being trapped between the mattress and the bed head or wall, overheating through the use of doonas or electric blankets, falling out of bed or being rolled on.

#### *Controlled crying*

This term is no longer in widespread current use or well-defined, but it remains controversial. All approaches agree that infant crying is a behaviour designed to elicit parental care. There is more diversity in views about the emotional significance of crying for the baby and the range and kind of parental responses that are required. Some interpret the term ‘controlled crying’ to mean that periods of infant crying are ignored. The Australian Association of Infant Mental Health for example uses this interpretation and is concerned that “controlled crying” is not consistent with what infants need for their optimal emotional and psychological health, and may have unintended negative consequences (158). The now more widely used terms to describe Infant Behaviour Management approaches include “Controlled Comforting”, “Progressive Waiting” and “Camping Out” and have replaced “Controlled Crying” in the professional lexicon, although it is still sometimes used in lay discourse. None of these approaches recommend that infant crying should be ignored, but they do advocate cognitively focused rather than emotionally focused responses (58). These include reducing unsustainable responses to

crying and substituting forms of comfort that are reassuring to the baby and are more sustainable like pre-bedtime soothing routines, regular patting and short opportunities to learn to self-settle. There is recognition that parents can feel anxious and require support as they learn these strategies.

# Consultations with professionals about understandings and responses concerning unsettled infant behaviour

The ways in which diverse understandings and recommended responses to unsettled infant behaviour influence clinical and other health and welfare services, government policies and workforce requirements cannot be ascertained from the existing literature. We therefore undertook specific consultations with key expert practitioners, policy makers and other stakeholders to identify their opinions and understandings about unsettled infant behaviour and responses to families seeking assistance and their recommendations for future action.

## Roundtable consultation

First, we convened a roundtable consultation with individuals and representatives of groups who hold expert positions about unsettled infant behaviour. Participants came from metropolitan and rural Victoria, New South Wales, Queensland, Western Australia and South Australia. The purpose of the consultation was to engage in constructive dialogue with people who hold a range of views; to identify sources of knowledge that underpin current practice; and to inform future communication and research. Table 1 describes the groups and sectors that were represented at the consultation. The individuals who participated are listed in Appendix 1. The roundtable discussion was held at University House at the University of Melbourne on 19 November 2009. It was facilitated by Dr Meg Montague, an independent social policy, research and evaluation consultant.

**Table 2: Sectors and organisations represented at the roundtable**

Sector	Organisation / discipline
Research organisations	Centre for Women's Health, Gender and Society, University of Melbourne Centre for Community Child Health, Murdoch Children's Research Institute Mother and Child Health Research, La Trobe University; Centre for Sleep Research, University of South Australia University of Queensland Parenting Research Centre
Government	Victorian Department of Education and Early Childhood Development Victorian Department of Health South West Sydney Area Health Service
Hospital	The Royal Children's Hospital The Royal Women's Hospital

<b>Early parenting centres</b>	Karitane, New South Wales Masada Private Hospital Mother Baby Unit, Victoria Mercy Health-O'Connell Family Centre, Victoria Ngala, Western Australia Tweddle Child and Family Health Service, Victoria.
<b>Non-government organisations</b>	SIDS and Kids Australia Australian Association for Infant Mental Health Australian Breast Feeding Association
<b>Individual practitioners</b>	Lactation consultant Early parent and infant consultant Paediatrician Maternal and child health nurse Midwife General practitioner Social worker Sleep psychologist

The discussion was not audio recorded, but with the permission of participants, detailed notes were taken and feedback from small and whole group discussions was noted on a flip chart by the facilitator. A summary of views has been drawn from these sources. None are attributable to a particular person, or organisation.

There was general agreement among participants that:

- Health professionals, clinical services and government policies are committed to optimizing the health and functioning of infants and families.
- There is a need to reduce confusion and increase clarity for families, practitioners and policy makers about responses to unsettled infant behaviour.
- Relationships and referral pathways among maternity hospitals and primary and secondary health services in the community can be difficult for parents to comprehend and make help-seeking for unsettled infant behaviour difficult.
- It is essential to provide a safe sleeping environment for a baby.
- Physical health problems in the infant should be assessed as part of a comprehensive response to unsettled behaviour.
- Interventions have to take family structure, quality of support available to the family and the socioeconomic and cultural context into account.
- Education for parents about developmental capacities and changes is important in promoting optimal responses to unsettled infant behaviour.
- Empathic listening to understand parents' perspectives and needs is essential in responding to unsettled infant behaviour.
- Blaming parents for their infant's behaviour is inappropriate and should be avoided.

There was a wider diversity of views and less agreement about the following questions:

- How much sleep do infants need at each age / stage of development?
- How much infant crying is excessive at each age / stage of development?
- Is unsettled infant behaviour normal or is it a pathological state?
- What is the emotional significance of crying for the infant? Does crying mean that the infant is sad and in need of comfort or does it reflect developmental capacities including tolerance of stimulation and needs for sleep?
- Can it be assumed that the mother is an expert whose intuitive responses will guide her care-giving or should she be viewed as a woman with learning needs for information and skills in infant care?
- Is it helpful for parents seeking help for unsettled infant behaviour to be reassured that it is normal?
- How does the current clinical emphasis on discussing options with parents in a process of collaborative decision-making meet the needs of those parents who are seeking specific advice or direct recommendations?
- What is the definition of co-sleeping and what constitutes a safe sleeping environment?
- Is the maintenance of breastfeeding supported or undermined by infant behaviour management strategies?
- What constitutes an evidence base for advice about responses to unsettled infant behaviour? Is authoritative knowledge only derived from scientific enquiry or are clinical or personal experiences of equivalent value?
- Does the focus on “evidence” preclude consideration of the importance of individual family, social and cultural situations?
- Do the rights of the baby outweigh the rights of the mother?
- Does maternal depression or anxiety have to be treated before infant crying can be addressed or can they be assisted together by infant behaviour management approaches?

There was general agreement that further research is needed in order to be able to address these differences including:

- In what ways do health, parental relationships, socio-economic status, and culture influence perceptions of unsettled infant behaviour?
- What is the role of the father in responding to unsettled infant behaviour effectively?
- What strategies should be recommended and at what infant age / stage of development?
- What is the relationship between infant behaviour management strategies and sustaining breastfeeding?
- The primary health care workforce is diverse in age and experiences of education and training, and therefore in their understanding of and attitudes to evidence-based practice. How can the best available evidence be translated into consistent clinical practice?

It was agreed overall that priorities, language and information bases differ within and between groups and can create knowledge silos which must be addressed by respectful dialogue. It was also agreed that service providers have different primary focuses which influence their responses to these problems: e.g. the infant, the mother, sleep, feeding, breastfeeding, infant weight gain, emotional development and the infant-mother relationship. The lack of clinical practice or other guidelines contributes to this complex and somewhat undifferentiated environment. Some health workers want to be able to exercise clinical judgment; others seek explicit recommendations and training in order not to contribute to parental confusion. It was also agreed that personal experience is very powerful in governing professional responses and expert opinion and that while this can promote empathy it can also reduce objectivity.

## **Maternal and child health nurse interviews**

In all Australian settings primary health care nurses specialised in the health of infants and their mothers and based in local facilities are at the frontline of assisting families who are experiencing unsettled infant behaviour. In Victoria these professionals are known as Maternal and Child Health Nurses (MCHNs). We acknowledge that practices might differ between states, but were assured that the similarities are likely to outweigh the differences and that Victorian practitioners would represent national diversity accurately.

With the assistance of Victorian State Maternal and Child Health Coordinators we invited MCHNs from regional and metropolitan areas of Victoria to participate in semi-structured interviews and group discussions. These practitioners were asked to appraise the magnitude and severity of the problem of unsettled infant behaviour, to reflect on their current practice in this area and to identify gaps in knowledge relevant to their work. The interviews were also intended to identify current practice in using infant behaviour management strategies with parents, nurses' views about the need for these strategies, and whether these could or should be incorporated into routine care and, if so, at what infant age. Finally, the interviews sought to identify practitioners' views about their own training and resource needs and barriers to change in current practice. Detailed interviewer notes were taken during interviews and discussions with 18 MCHN volunteers and used for analysis. This sample of opinions and clinical practice descriptions is not intended to be representative of other MCH nurses in Victoria or other states, but does serve to document the diversity of positions in this primary health care service.

### ***Interview findings***

MCH nurses were unanimous in the view that the consequences of unsettled infant behaviour for women's health are considerable; that a large component of their professional work with families involves providing advice to parents about infant sleep and settling, and that sleep deprivation and fatigue are important contributors to mental health problems in mothers of infants. Most but not all informants agreed that in order to meet their minimum sleep requirements, infants under the age of 12 months should receive care-giving that provides some daily routine. Most nurses thought that giving this advice and teaching parents about appropriate strategies were important components of the education that they provide to all families caring for newborns and infants.

A variety of terms is in common use amongst MCH nurses when talking to parents about care-giving practices to promote settled infant behaviour. Terms include "settling techniques"; "tired signs"; "routines"; "understanding baby cues"; "Feed-Play-Sleep";

“sleep cycles”; “controlled comforting”; “self settling”; “teaching your baby to fall asleep”. Terms like “controlled crying” are regarded as being more appropriate for use in a treatment setting than in universal parent education. MCH nurses generally agreed that parents should be taught how to wrap their infant in readiness for sleep, that a “Feed-Play-Sleep” routine should be encouraged and that parent education that encourages a baby to self-settle is generally desirable. Teaching the “Feed-Play-Sleep” routine appears to be routine in some services. Recognising that the standard postnatal hospital stay is too short to permit this to happen during the maternity admission, MCH nurses acknowledged the central importance of their professional role in teaching these specific skills to parents.

However, there was less agreement about the details of what is taught to parents or about the age at which these ideas should be introduced. One informant declared that she teaches “sleep and settling” at the first home visit, because of the important role of MCH nurses in prevention, but another said that it should not be talked about prior to 8 months. Nurses were in agreement that parents should be encouraged to recognise their baby’s tired cues, but some were adamant that any strategy that involves leaving a baby under the age of one year to cry is inappropriate and should not be used. Several informants said that they encouraged parents to choose from a range of options provided to them based on parents’ own and their baby’s personalities and preferences. For one nurse, this approach involved her need to manage differences in her professional and personal viewpoints. Nurses recognised the diversity of personal and professional opinion and the inconsistency of clinical practice, but emphasised the need to be flexible and accommodate parental preference.

Informants were asked to describe the sources of information underpinning their clinical practice in this area. Few referred to any form of pre-service education, and all identified post-service training as the current most important knowledge source. Victoria’s Key Ages and Stages Framework (109), underpins universal standard MCH care. The Practice Guidelines describe the components of the 7 standard MCH visits available to families during the first 12 months of an infant’s life, provide additional resources for nurses and set out the reporting requirements (159). The Framework includes an evidence-based sleep and settling strategy to be offered to parents as treatment for infants with sleep and settling difficulties at the eight-month visit. Most MCH nurses accepted that this was appropriate care. Training for all MCH nurses was provided as part of implementation of the Framework. Aside from the training for the Framework, MCHNs had attended a variety of seminars, training programs and pre-conference workshops. Professional development programs are offered by specialist services including in Victoria, the Centre for Community Child Health at the Royal Children’s Hospital, the Parent Infant Research Institute at the Austin Hospital and the Australian Infant Mental Health Association. Nurses attended these programs either at their own expense or as funded professional development. Some nurses in rural and regional locations explained the workforce difficulties created by the need to take time away from their service to attend programs in the city. Others had access to events that were offered in their local communities. Some informants had been exposed to professional training provided by international training groups and local independent practitioners. The NCAST® Keys to Caregiving program (145) was referred to by a number of informants and is influential. This program in which effectiveness has not yet been established in a randomised controlled trial aims to assist parents and care-givers to provide safe and nurturing environments for young children and to strengthen the parent-infant relationship. While it has a section on promoting good sleep in infants it is not a treatment program for unsettled infant behaviour *per se*. Use of the program requires intensive training and establishment of formal credentials

and it is not clear how many people who refer to NCAST<sup>®</sup> approaches are actually formally trained in it. It is also unclear whether this is an appropriate program for parents who are seeking assistance for unsettled infant behaviours.

In recent years a number of specialised Attachment Theory-informed clinical interventions have been developed to treat moderately to seriously impaired infant parent relationship problems e.g. Circle of Security<sup>™</sup> (162). Some clinicians have undertaken the two-day introductory or ten-day intensive training course which has provided them with an introduction to Attachment Theory. The Circle of Security intervention is a group intervention aimed at changing parents' attachment-based representations of their infant and thus their responsiveness. However the parent's response rather than the infant's specific crying and sleep behaviours are the focus of the intervention. Some clinicians will use Attachment Theory and the signs of an impaired infant parent relationship to inform their clinical consultation with infants and families presenting with sleep and crying problems. In the consultations with MCH nurses the term "attachment" was used loosely to refer to the importance of supporting and promoting optimal parent infant relationships in clinical practice.

Nurses drew extensively on their clinical experience in framing their advice to parents. The positive impact on women's wellbeing of establishing an early sleep and settling routine "even for women with postnatal depression" was a frequent motivator for giving this advice. Although there was general agreement that clinical practice could be improved, several barriers to change were identified. Of primary importance was the cultural diversity in their local communities regarding child-rearing beliefs and practices, and in attitudes to and expectations of health services. The nurses emphasised their professional responsibility to recognise and respond appropriately to this diversity. Language difficulties and individual beliefs and cultural practices can limit shared understanding and parents' willingness to accept advice. Some but not all nurses believed that sleep and settling advice might be different from breastfeeding advice which recommends that infants be "fed on demand". The perceived lack of research evidence about the benefits and risks of infant behaviour management strategies was identified as problematic, as was the inaccessibility of the research literature for those without an institutional affiliation. Some questioned the authority of an individual MCHN's voice in the context of conflicting views of their professional colleagues, and the competing information freely available to parents from their peers, families of origin including their own parents and grandparents, and on the internet, in books and from other resources.

## Discussion

This process of reviewing diverse sources and consulting experts has revealed that while there is general agreement that unsettled infant behaviour is problematic for many families and is associated with distress and help seeking, there are no consistent understandings of the nature and severity of this problem or of the most appropriate responses to it. It has been more difficult to describe fully the range of parenting advice that is not drawn from research evidence or manualised clinical interventions.

This lack of clarity is apparent in a range of views about whether unsettled infant behaviours should be regarded as part of a normal continuum; indicators of a problem only if identified as such by parents; or conceptualised and named as problematic and perhaps categorised into a distinct condition. Similarly there is a diversity of views about the age at which these behaviours can be thought about as difficult or challenging. Some argue that prolonged crying, resistance to soothing and dysregulated sleep can be experienced as problematic from the earliest weeks of life and others that these behaviours can only be considered in this way in infants who are older e.g. at four, six, eight or twelve months of age. Explanatory models for these behaviours are also diverse. Some argue that they reflect infant emotional states like separation anxiety and needs for proximity to and comfort from care-givers. Others argue that unsettled infant behaviours are not readily understood, and that once physical health conditions have been excluded, variations in infant temperament might underpin some of these, they are worse if infants are tired and over-stimulated and parental care-giving practices might moderate them. There is more agreement that unsettled infant behaviours are associated with distress and compromised functioning in parents. Some propose that maternal mental health problems are causally linked to unsettled infant behaviours. A more consistent view is that parenting confidence, health and wellbeing can be undermined in this context and that unsettled infant behaviours have adverse consequences for parents and relationships and are associated with high rates of help seeking and health service use thereby imposing a burden on the health system.

Parents in Australia developing a relationship with their new baby and adjusting to the work of infant care, in particular those experiencing unsettled infant behaviours are therefore placed in a complex predicament. If they turn to self-help resources they will encounter varied explanations of infant behaviour and recommendations about how to understand and respond to it. Most resources do not acknowledge this complexity and many provide no reference to the sources of evidence that have been drawn on or to an auspicing body. Some provide clear and unambiguous advice, supported by clinical, scientific and public health research evidence. Others provide non-specific advice including about what loving responses to infants might be, with recommendations about risks of withholding care to later development and adjustment.

A comparable situation applies to seeking assistance from health professionals, whose responses are varied. They include diverse theories about the meaning of infant cries and whether sleep behaviours are learned or occur spontaneously. Philosophical positions focus variously on the needs of the infant, the parent, or the parent-infant relationship. Similarly, views about the nature and role of evidence and the place of personal experiences, clinical observations and scientific enquiry are not consistent.

The general lack of clarity limits the potential role of health care professionals in primary prevention and early intervention for unsettled infant behaviour. For example the MCHN page of the Victorian Government Department of Education and Early Childhood

Development website recommends the use of evidence-based infant behavioural management strategies (163). Nurses are also advised they “should encourage the parent to explore alternative strategies, provide reassurance and respect for the strategy decided upon”. The website offers a range of telephone (n=5) and alternative websites (n=9) for further advice, including the South Australian Government’s Children, Youth and Women’s Health Service (CYWHS) (144). However the advice provided there for babies from 6 months to 3 years is inconsistent with advice on the Victorian Government website (108). The CYWHS advice is that “Some people may suggest that you let your baby / toddler 'cry it out' or that you use controlled crying/comforting. Your baby/toddler needs you to respond when he cries, to help him feel safe” and “Most children no longer need to share their parent’s bed or bedroom by the time they are 4 or 5, unless something stressful is happening in their lives. . . . In some families, children sleep in the same room as their parents for many years. This can help children feel very safe” (144).

Scientific evidence is based on peer-reviewed methodologies to test theories that support particular conclusions. This provides the strongest evidence, particularly of potential risks; however, this level of evidence is not always available. Generating evidence, in particular through randomised controlled trials, is a meticulous and slow process. Evaluation of multiple outcomes including for the infant, the parents and parent-infant relationships requires ambitious trials in particular if direct observation of parent-infant interactions is required. Evidence is not always accessible to a general audience, nor is it necessarily the basis for professional training. It is acknowledged that authoritative knowledge is also gained from personal and clinical experience, but it can be difficult for people to distinguish between scientific and personal sources of authority. In addition, even when knowledge has been gained from scientific evidence it is not always compatible with a health professional’s personal values and beliefs which might predominate in the guidance they provide. Evidence about reductions in infant crying and fussing and improvements in infant sleep and maternal mental health associated with the use of infant behaviour management strategies is consistent. However, despite a lack of reliable evidence, strongly held views that breastfeeding is undermined, that infant mental health is compromised and infant capacity to trust adult care-givers reduced and that long term attachment problems result from the use of these techniques remains.

The implications for public health practice and policy, including the economic costs of untreated unsettled infant behaviours and the costs and potential savings of either IP or IBM approaches remain under-elaborated. While IBM treatment approaches for primary health care practitioners have been documented, tested and costed in Australia (56, 150), equivalent data for IP approaches are not yet available.

Overall this situation constitutes an important challenge. It is well established that conflicting, non-specific, emotionally charged advice is unhelpful for parents, especially when they are anxious about infant well-being and fatigued. Intensely contested positions among different professional and advocacy groups are inevitably influential and have the potential to undermine health care consumer confidence and the careful focus on solutions that is required. Parents of infants are entitled to clear consistent guidance, derived from high quality evidence. Similarly health professionals are at present faced with qualified or conflicting practice guidelines, and have limited access to specific evidence-informed locally available training in the prevention, early intervention for and treatment of unsettled infant behaviour.

# Recommendations for developing consensus guidelines

There remains a lack of agreement in Australia about how unsettled infant behaviour is best understood, its consequences for mothers, fathers and family relationships and the safest, most effective responses that health care and social welfare professionals can offer. Progress towards clarity in these matters and ultimately the development of national guidelines can be advanced by addressing a series of specific questions in one of two ways. First, for some of these questions evidence is already available, but a systematic dissemination strategy is required. Second, for other questions knowledge gaps remain and there is a need for research to address these and inform improvements in practice and policy. The questions include:

- What is the constitution of normal infant sleep and in what ways do sleep needs and patterns change across the first year of life?
- What is the appropriate age at which to cease offering overnight feeds?
- What is the impact of unsettled infant behaviour on parental functioning and mental health in the short, medium and long term?
- What are the medium and long term effects on child development, parent health and parent-child relationships of using behaviour management strategies to address infant crying and sleeping problems?
- Are there differences in responses to the use of IBM approaches for babies who are securely attached compared to those whose attachments are insecure or disorganised?
- How can the needs of babies who do not respond to IBM approaches be understood and responded to?
- What do the instructions to “feed on demand” or “according to need” mean to parents of newborns and for how long should they follow this recommendation?
- What is the relationship between the use of infant behaviour management strategies and the maintenance of breastfeeding?
- What does co-sleeping mean to Australian parents and primary health care professionals and how many parents share a bed with their infants?
- What constitutes age-appropriate advice about responding to excessive or prolonged infant crying?
- What constitutes age-appropriate advice about responding to frequent overnight waking and short daytime sleeps in infants?
- How can the needs of parents who do not want to use behaviour management strategies be understood and met?
- What are the economic costs of untreated unsettled infant behaviours in Australia?
- What are the economic costs and benefits of the diverse interventions for unsettled infant behaviour in Australia?

Dissemination and where necessary generation of this evidence will contribute to improved clarity and consistency in health education and health care for parents of infants in the Australian context. It will also inform pre-service and post-service education and training for health care professionals who will benefit from an evidence-based approach to practice in the care of infants and parents.

The Australian Research Alliance for Children and Youth is well placed to lead progress in this field, including through an authoritative dissemination strategy for evidence that is already available; the establishment of a research agenda to address gaps in knowledge; identification of needs for pre-service education and professional development for health professionals, and public education to assist parents to be well informed consumers of advice about responding to unsettled infant behaviour.

## References

1. Lehtonen L, Gormally S, Barr RG. 'Clinical pies' for etiology and outcome in infants presenting with early increased crying. In: Barr R, Hopkins B, Green J, editors. *Crying as a sign, a symptom, and a signal*. London: MacKeith Press; 2000. p. 67-95.
2. Oberklaid F. Editorial comment. Persistent crying in infancy: A persistent clinical conundrum. *J Paediatr Child Health*. 2000;36:297-8.
3. Wolke D, Gray P, Meyer R. Excessive infant crying: a controlled study of mothers helping mothers. *Pediatrics*. 1994;94(3):322-32.
4. Wessel M, Cobb J, Jackson E, Harris G, Detwiler A. Paroxysmal fussing in infancy, sometimes called "Colic" *Pediatrics*. 1954 November;14 (5):421-35
5. Reijneveld SA, Brugman E, Hirasing RA. Excessive infant crying: the impact of varying definitions. *Pediatrics*. 2001 October 2001;108(4):893-7.
6. Barr R. Changing our understanding of infant colic. *Archives of Pediatric & Adolescent Medicine*. 2002 Dec;156(12):1172-4.
7. Hiscock H, Jordan B. Problem crying in infancy. *MJA Practice Essentials - Paediatrics*. 2004 1 November 2004;181(9):507-12.
8. Sadeh A, Mindell JA, Luedtke K, Wiegand B. Sleep and sleep ecology in the first 3 years: a web-based study. *Journal of Sleep Research, Sleep Medicine Reviews*. 2009;18:60-73.
9. Long T, Johnson M. Living and coping with excessive infantile crying. *J Adv Nurs*. 2001 Apr;34(2):155-62.
10. Craig K, Gilbert-Macleod C, Lilley C. Crying as an indicator of pain in infants. In: Barr R, Hopkins B, Green J, editors. *Crying as a sign, a symptom and a signal*. London: MacKeith Press; 2000.
11. Heine RG, Jordan B, Lubitz L, Meehan M, Catto-Smith AG. Clinical predictors of pathological gastro-oesophageal reflux in infants with persistent distress. *J Paediatr Child Health*. 2006;42 1(3):134 - 9.
12. Miller A, Barr R. Infantile colic. Is it a gut issue? *Pediatr Clin North Am*. 1991 Dec;38(6):1407-23.
13. Heine R, Jaquiere A, Lubitz L, Cameron B, Catto-Smith A. Role of gastro-oesophageal reflux in infant irritability. *Arch Dis Child*. 1995; 73:121-5.
14. Barr RG, Gunnar M. Colic: the 'transient responsivity' hypothesis. In: Barr R, Hopkins B, Green J, editors. *Crying as a sign, a symptom, and a signal*. London: MacKeith Press; 2000.
15. Oberklaid F, Prior M, Golvan D, Clements A, Williamson A. Temperament in Australian infants. *Aust Paediatr J*. 1984;20:181-4.
16. Sanson A, Prior M, Oberklaid F. Normative data on temperament in Australian infants. *Australian Journal of Psychology*. 1985;37:185-95.
17. Sanson A, Prior M, Garino E, Oberklaid F. The structure of infant temperament: factor analysis of the Revised Temperament Questionnaire. *Infant Behavior and Development*. 1987;10(1, Jan-Mar):97-104.
18. White BP, Gunnar MR, Larson MC, Donzella B, Barr RG. Behavioral and physiological responsivity, sleep, and patterns of daily cortisol production in infants with and without colic. *Child Dev*. 2000 Jul-Aug;71(4):862-77.
19. Rothbart MK. Measurement of temperament in infancy. *Child Dev*. 1981;52:569-78.

20. Barr RG, Kramer MS, Pless IB, Boisjoly C, Leduc D. Feeding and Temperament as Determinants of Early Infant Crying/Fussing Behavior. *Pediatrics*. 1989;84:514-21.
21. Brazelton T. Crying and Colic. *Infant Mental Health Journal*. 1990 Winter 11(4).
22. Fisher J, Rowe H, Feekery C. Temperament and behaviour of infants aged four to twelve months on admission to a private mother-baby unit and at one and six months follow up. *Clinical Psychologist*. 2004;8(1):15 - 21.
23. Barr RG, Konner M, Bakeman R, Adamson L. Crying in !Kung San infants: a test of the cultural specificity hypothesis. *Dev Med Child Neurol*. 1991;33:601-10.
24. St James-Roberts I, Bowyer J, Varghese S, Sawdon J. Infant crying patterns in Manali and London. *Child: Care Health and Development*. 1994;20:323-37.
25. Alvarez M. Caregiving and Early Infant Crying in a Danish Community. *Developmental and Behavioral Pediatrics*. 2004;25(2):91-8.
26. van Ijzendoorn MH, Hubbard FO. Are infant crying and maternal responsiveness during the first year related to infant-mother attachment at 15 months? *Attach Hum Dev*. 2000 Dec;2(3):371-91.
27. St James-Roberts I. Infant crying and sleeping: helping parents to prevent and manage problems. *Primary Care: Clinics in Office Practice*. 2008;35(3):547-67.
28. Hunziker UA, Barr RG. Increased Carrying Reduces Infant Crying: A Randomized Controlled Trial. *Pediatrics*. 1986;77:641-8
29. Walker A, Menahem S. Intervention of supplementary carrying on normal baby crying patterns: a randomized study. *J Dev Behav Pediatr*. 1994;15:174-8.
30. St James-Roberts I, Hurry J, Bowyer J, Barr R. Supplementary carrying compared with advice to increase responsive parenting as interventions to prevent persistent infant crying. *Pediatrics*. 1995;95:381-8.
31. Milgrom J, Westley D, McCloud P. Do infants of depressed mothers cry more than other infants? *J Paediatr Child Health*. 1995;31:218-21.
32. Armstrong K, O'Donnell H, McCallum R, Dadds M. Childhood sleep problems: Association with prenatal factors and maternal distress/depression. *J Paediatr Child Health*. 1998;34:263-66.
33. Maxted AE, Dickstein S, Miller-Loncar C, High P, Spritz B, Liu J, et al. Infant colic and maternal depression. *Infant Mental Health Journal*. 2005 January/February 2005;26(1):56-68.
34. Righetti-Veltema M, Conne-Perreard E, Bousquet A, Manzano J. Postpartum depression and mother-infant relationship at 3 months old. *J Affect Disord*. 2002;70:291-306.
35. Wake M, Morton-Allen E, Poulakis Z, Hiscock H, Gallagher S, Oberklaid F. Prevalence, Stability, and Outcomes of Cry-Fuss and Sleep Problems in the First 2 Years of Life: Prospective Community-Based Study *Pediatr Rev*. 2006 March 1, 2006;117 (3):836-42.
36. Vik T, Grote V, Escribano J, Socha J, Verduci E, Fritsch M, et al. Infantile colic, prolonged crying and maternal postnatal depression. *Acta Paediatr*. 2009;98:1344-8.
37. Weir I, Dinnick S. Behaviour modification in the treatment of sleep problems occurring in young children: a controlled trial using health visitors as therapists. *Child Care Health Dev*. 1988;14:355-67.
38. Barr R, Gunnar M. Colic: the transient responsivity hypothesis. In: Barr R, Hopkins B, Green J, editors. *Crying as a sign, a symptom and a signal*. London: MacKeith Press; 2000.
39. Morrell J. The role of maternal cognitions in infant sleep problems as assessed by a new instrument, the maternal cognitions about infant sleep questionnaire. *Journal of Child Psychology and Psychiatry* 1999;40(2):247-58.

40. Bayer J, Hiscock H, Hampton A, Wake M. Sleep problems in young infants and maternal mental health and physical health. *J Paediatr Child Health*. 2007;43(8):66-73.
41. Barr RG, Kramer MS, Pless B, Boisjoly C. Feeding and Temperament as Determinants of Early Infant Crying/Fussing Behavior. *Pediatr Rev*. 1989 September 1989;84(3):514-21.
42. St James-Roberts I, Alvarez M, Csipke E, Abramsky T, Goodwin J, Sorgenfrei E. Infant crying and sleeping in London, Copenhagen and when parents adopt a "proximal" form of care. *Pediatrics*. 2006 Jun;117(6):e1146-55.
43. World Health Organization. Global Strategy for Infant and Young Child Feeding 2010 [cited 3 September 2010; Available from: [http://www.who.int/child\\_adolescent\\_health/topics/prevention\\_care/child/nutrition/breastfeeding/en/print.html](http://www.who.int/child_adolescent_health/topics/prevention_care/child/nutrition/breastfeeding/en/print.html)]
44. Messer D, Harris GS, St James-Roberts I. An overview of infant crying, feeding and sleeping problems. In: St James-Roberts I, Harris GS, Messer D, editors. *Infant Crying, Feeding and Sleeping: Development, Problems and Treatments*. London: Harvester Wheatsheaf; 1993. p. 211-30.
45. Pinilla T, Birch L. Help me make it through the night: Behavioral entrainment of breast-fed infants' sleep patterns. *Pediatrics*. 1993;91(2):436-44.
46. St James-Roberts I, Sleep J, Morris S, Owen C, Gillham P. Use of a behavioural programme in the first 3 months to prevent infant crying and sleeping problems. *Journal of Paediatric and Child Health*. 2001;37:289-97.
47. Nikolopoulou M, St James-Roberts I. Preventing sleep problems in infants who are at risk of developing them. *Arch Dis Child*. 2003;88:108-11.
48. Sadeh A, Tikotzky L, Scher A. Parenting and infant sleep. *Sleep Medicine Reviews*. 2010;14:89-96.
49. Burnham M, Goodlin-Jones B, Gaylor E, Anders T. Night time sleep-wake patterns and self-soothing from birth to one year of age: a longitudinal intervention study. *Journal of Child Psychology and Psychiatry*. 2002;43(6):713-25.
50. Barber C, Abernathy T, Steinmetz B, Charlebois J. Using a breastfeeding prevalence survey to identify a population for targeted programs. *Can J Public Health*. 1997;88(4):242-5.
51. Long A, McCarney S, Smyth G, Magorrian N, Dillon A. The effectiveness of parenting programmes facilitated by health visitors. *J Adv Nurs*. 2001;34(3):611 - 20.
52. St James-Roberts I, Halil T. Infant crying patterns in the first year: normal community and clinical findings. *J Child Psychol Psychiatry*. 1991;32(6):951-68.
53. Armstrong K, Quinn R, Dadds M. The sleep patterns of normal children. *The Medical Journal of Australia*. 1994;161:202-6.
54. Beebe S, Casey R, Pinto-Martin J. Association of reported infant crying and maternal parenting stress. *Clin Pediatr (Phila)*. 1993:15-9.
55. Hiscock H, Wake M. Infant sleep problems and postnatal depression: a community-based study. *Pediatrics*. 2001;107(6):1317-22.
56. Hiscock H, Bayer JK, Hampton A, Ukoumunne OC, Wake M. Long-term mother and child mental health effects of a population-based infant sleep intervention: cluster-randomized, controlled trial. *Pediatrics*. 2008 Sep;122(3):e621-7.
57. McKay P. 100 ways to calm the crying. South Melbourne: Lothian Books; 2002.
58. Rowe H, Fisher J. Development of a universal psycho-educational intervention to prevent common postpartum mental disorders in primiparous women: a multiple method approach *BMC Public Health*. 2010;10:499.

59. Papousek M, Wurmser H, von Hofacker N. Clinical perspectives on unexplained early crying: challenges and risks for infant mental health and parent-infant relationships. In: Barr R, St. James-Roberts I, Keefe M, editors. *New evidence on unexplained early infant crying: its origins, nature and management*; 2001 p. 289-316.
60. Wolke D, Rizzo P, Woods S. Persistent Infant Crying and Hyperactivity Problems in Middle Childhood. *Pediatrics*. 2002;109:1054-60.
61. Rao M, Brenner R, Schisterman E, Vik T, Mills J. Long term cognitive development in children with prolonged crying. *Arch Dis Child*. 2004;89:989-92.
62. Brown M, Heine RG, Jordan B. Health and well-being in school-age children following persistent crying in infancy. *J Paediatr Child Health*. 2009 2009;45(5):254-62.
63. Brockington I, Macdonald E, Wainscott G. Anxiety, obsessions and morbid preoccupations in pregnancy and the puerperium. *Arch Womens Ment Health*. 2006;9(5):253-63.
64. Brockington I. Postpartum psychiatric disorders. *Lancet*. 2004;363:8.
65. Phillips J, Sharpe L, Matthey S. Rates of depressive and anxiety disorders in a residential mother-infant unit for unsettled infants. *Aust N Z J Psychiatry*. 2007 2007;41(10):836-42.
66. Rowe HJ, Fisher J, Loh W. The Edinburgh Postnatal Depression Scale detects but does not distinguish anxiety disorders from depression in mothers of infants. *Arch Womens Ment Health*. 2008;11(2):103-8.
67. Fisher J, Hammarberg K, Baker H. Assisted conception: a risk factor for postpartum admission to a private hospital mother baby unit? *Fertil Steril*. 2005;84:426 - 30.
68. Mayberry LJ, Affonso DD. Infant temperament and postpartum depression: a review. *Health Care Women Int*. 1993;14:201-11.
69. Murray L, Cooper PJ. Effects of postnatal depression on infant development. *Arch Dis Child*. 1997;77(2):99-101.
70. Milligan R, Lenz ER, Parks PL, Pugh LC, Kitzman H. Postpartum Fatigue: Clarifying a Concept. *Sch Inq Nurs Pract*. 1996;10(3):279-91.
71. Rogers N, Grunstein R. Working and sleeping around the clock. Sleep Loss Symposium Report. *Med J Aust*. 2005;182:444 - 5.
72. Fisher J. The unpaid workload: Gender discrimination in conceptualisation and its impact on maternal wellbeing. In: Chandra PS, Herrman H, JRW F, Kastrup M, Niaz U, Rondon MB, et al., editors. *Contemporary Topics in Women's Mental Health*. Chichester, UK: Wiley-Blackwell; 2009. p. 525-38.
73. Smith J, Ellwood M. Where does a mother's day go? Preliminary estimates from the Australian Time Use Survey of New Mothers. Research Report Number 1. Canberra: Australian National University Australian Centre for Economic Research on Health; 2006.
74. Taylor J, Johnson M. How women manage fatigue after childbirth. *Midwifery Today Childbirth Educ*. 2010;26(3):367-75.
75. Fisher JRW, Feekery CJ, Rowe-Murray HJ. Nature, severity and correlates of psychological distress in women admitted to a private mother-baby unit. *J Paediatr Child Health*. 2002;38(2):140 - 5.
76. Dennis C-L, Ross L. Relationships among infant sleep patterns, maternal fatigue and development of depressive symptomatology. *Birth*. 2005;32(3):187-93.
77. Cox JL, Holden JM, Sagovsky R. Detection of postnatal depression. Development of the 10-item Edinburgh Postnatal Depression Scale. *Br J Psychiatry*. 1987;150:782-6.
78. Lam P, Hiscock H, Wake M. Outcomes of Infant Sleep Problems: A Longitudinal Study of Sleep, Behavior, and Maternal Well-Being. *Pediatrics*. 2003;111(3):e203-7.

79. Small R, Brown S, Lumley J, Astbury J. Missing voices: what women say and do about depression after childbirth. *Journal of Reproductive and Infant Psychology*. 1994;12:89-103.
80. Harris M. Karitane Mothercraft Society. *Med J Aust*. 1992;156:292.
81. Leeson R, Barbour J, Romanuik D, Warr R. Management of infant sleep problems in a residential unit. *Child Care Health Dev*. 1994;20:89-100.
82. McMahon C, Barnett B, Kowalenko N, Tennant C, Don N. Postnatal depression, anxiety and unsettled infant behaviour. *Aust N Z J Psychiatry*. 2001;35:581-8.
83. Matthey S, Speyer J. Changes in unsettled infant sleep and maternal mood following admission to a parentcraft residential unit. *Early Hum Dev*. 2008;84(9):623-9.
84. Treyvaud K, Rogers S, Matthews J, Allen B. Outcomes Following an Early Parenting Center Residential Parenting Program *J Fam Nurs*. 2009 15:486-501.
85. Rowe H, Fisher J. The contribution of Australian residential early parenting centres to comprehensive mental health care for mothers of infants: evidence from a prospective study. *Int J Ment Health Syst*. 2010; 4:6.
86. Oddy B, Rowe H, Fisher J. Consumers' views on the use of diagnostic labels to describe psychological distress in the postpartum: implications for health care. *Australian Journal of Primary Health*. 2009;15:9-16.
87. Ellett M, Appleton M, Sloan R. Out of the Abyss of Colic: A View Through the Fathers' Eyes. *MCN Am J Matern Child Nurs*. 2009;34( 3):164-71.
88. Smart J, Hiscock H. Early infant crying and sleeping problems: A pilot study of impact on parental well-being and parent-endorsed strategies for management. *J Paediatr Child Health*. 2007;43(4):284 - 90.
89. Raiha H, Lehtonen L, Huhtala V, Saleva K, Korvenranta H. Excessively crying infant in the family: Mother-infant, father-infant and mother-father interaction. *Child Care Health Dev*. 2002;28(5):419-29.
90. Reijneveld Sa, Wal Mvd, Brugman E, Sing RaH, Verloove-Vanhorick SP. Infant Crying and Abuse. *Lancet*. 2004;364:1340-2.
91. Dias M, Smith K, deGuehery K, Mazur P, Li V, Shaffer M. Preventing Abusive Head Trauma Among Infants and Young Children: A Hospital-Based, Parent Education Program. *Pediatrics*. 2005;115 (4):e470 - e7.
92. Deyo G, Skybo T, Carroll A. Child Abuse & Neglect Secondary analysis of the "Love Me. . .Never Shake Me" SBS education program. *Child Abuse Negl*. 2008;32:1017-25.
93. Barr R. Period of PURPLE Crying: Keeping Babies Safe in North Carolina. 2010 [cited 25 August 2010; Available from: <http://www.purplecrying.info/index.php>
94. Meijer AM, van den Wittenboer GLH. Contribution of Infants' Sleep and Crying to Marital Relationship of First-Time Parent Couples in the 1st Year After Childbirth. *J Fam Psychol*. 2007;21(1):49-57.
95. Hiscock H. Rock-a-bye baby? Parenting and infant sleep. *Sleep Medicine Reviews*. 2010;14(3):e85-7.
96. Rowe-Murray H, Fisher J. Operative intervention in delivery is associated with compromised early mother-infant interaction. *Br J Obstet Gynaecol*. 2001;108:1068 - 75.
97. Lehtonen L. Infant Crying Behaviour: Comments on Oberlander, and St James-Roberts. *Encyclopedia on Early Childhood Development, Centre of Excellence for Early Childhood Development*. 2005;November 16.

98. UNICEF. A league table of child maltreatment deaths in rich nations. Florence: UNICEF Innocenti Research Centre; 2003.
99. Sheridan C, Wolfe N. If only you hadn't, I would not have hit you: infant crying and abuse. *Lancet*. 2004 October 9;364:1295-6.
100. Morris S, St James-Roberts I, Sleep J, Gillham P. Economic evaluation of strategies for managing crying and sleeping problems. *Arch Dis Child*. 2001;84(1):15-9.
101. Gunn J, Lumley J, Young D. Visits to medical practitioners in the first six months of life. *Journal of Paediatric and Child Health*. 1996;32:162-6.
102. Goldfeld SR, Wright M, Oberklaid F. Parents, infants and health care: Utilization of health services in the first 12 months of life. *J Paediatr Child Health*. 2003;39(4):249-53.
103. McCallum S, Rowe H, Gurrin L, Quinlivan J, Rosenthal D, Fisher J. Unsettled infant behaviour and health service use: a cross-sectional community survey in Melbourne, Australia. *Journal of Paediatric and Child Health*. In press.
104. Armstrong K, Previterra N, McCallum R. Medicalizing normality? Management of irritability in babies. *J Paediatr Child Health*. 2000;36:301-5.
105. Barnett B, Lochart K, Bernard D, Manicavasagar V, Dudley M. Mood disorders among mothers of infants admitted to a mothercraft hospital. *J Paediatr Child Health*. 1993;29:270-75.
106. Don N, McMahon C, Rossiter C. Effectiveness of an individualized multidisciplinary programme for managing unsettled infants. *J Paediatr Child Health*. 2002;38(6):563-7.
107. Fisher J, Rowe H, Hammarberg K. Admission of women for psychological and psychiatric causes with their infants in Victoria, Australia. *Aust N Z J Public Health*. In press.
108. Victorian State Government Department of Health. Better Health Channel: Parenting. Parenting 1 June 2010 [cited 26 July 2010; Available from: [http://www.betterhealth.vic.gov.au/bhcv2/bhcarticles.nsf/pages/Sleep\\_problems\\_babies?open](http://www.betterhealth.vic.gov.au/bhcv2/bhcarticles.nsf/pages/Sleep_problems_babies?open)
109. Victorian State Government Department of Education and Early Childhood Development and Municipal Association of Victoria. Maternal and Child Health Service: Key Ages and Stages Framework.
110. Attachment Parenting Australia. Nurturing our children for a happier world. [cited 26 July 2010; Available from: <http://www.attachmentparentingaustralia.com/index.htm>
111. SIDS and Kids. National web site. [cited 9 August 2010; Available from: <http://www.sidsandkids.org/>
112. Australian Association for Infant Mental Health Inc. [cited Accessed 26 July 2010]; Available from: <http://www.aaimhi.org/>
113. Raising Children Network. The Australian Parenting Website. [cited 26 July 2010; Available from: <http://raisingchildren.net.au/>
114. National Center for Infants Toddlers and Families. ZERO TO THREE. [cited 30 August 2010; Available from: <http://www.zerotothree.org/>
115. Centre For Attachment. Connecting wisdom with science, bringing attachment to life. [cited 21 September, 2010; Available from: [http://www.centreforattachment.com/index.php?option=com\\_frontpage&Itemid=1](http://www.centreforattachment.com/index.php?option=com_frontpage&Itemid=1)
116. Australian Breastfeeding Association. Breastfeeding Information. 30 April 2009 [cited 4 August 2010; Available from: <http://www.breastfeeding.asn.au/bfinfo/index.html>
117. Viotto M. It's time to sleep: How to get your child sleeping like a baby. Melbourne, Australia: Hybrid Publishers; 2004

118. Grace A. Andrea Grace's Gentle Sleep Solutions: How much sleep does your baby need? 2010 ed. London: Hodder Education; 2007.
119. Wiltshire J. The Baby Sleep Bible: Choosing what's right for you and your baby. Richmond, Surrey, UK: Crimson Publishing; 2009.
120. Faure M, Richardson A. Sleep sense: Simple steps to a full night's sleep. Welgemoed, South Africa: Metz Press; 2007.
121. Mezrah S. The Baby Sleeps Tonight: Your infant sleeping through the night by 9 weeks (yes, really!) Plus how to solve sleep problems up through Preschool. Illinois Sourcebooks Inc. ; 2010.
122. Ford G. The New Contented Little Baby Book: The secret to calm and confident parenting. London, UK: Vermilion, Ebury Publishing, Random House; 1999.
123. Hall T. Save Our Sleep: A parents' guide towards happy, sleeping babies from birth to two years. Sydney, Australia: Pan Macmillan Australia Pty Ltd; 2009.
124. Ferber R. Solve Your Child's Sleep Problems. Melbourne: Penguin; 2006.
125. Karp H. The Happiest Baby on the Block: Bantam Dell, Random House, Inc; 2002.
126. Stevens H. Safe Sleep Space. March 2009 ed. Eltham, Melbourne, Australia: Rebus Press; 2009.
127. Barker R. Baby Love: Everything you need to know about your new baby. 5 ed. Sydney: Pan Macmillan Australia Pty Ltd; 1994.
128. Tweddle Child and Family Health Service. Sleep Right Sleep Tight. Melbourne, Australia: Tweddle Child and Family Health Service; 2006.
129. Australian Breastfeeding Association. Breastfeeding Helpline Service - 1800 mum 2 mum. [cited 11 August 2011; Available from: <http://www.breastfeeding.asn.au/products/counselling.asp>
130. Stevens H, Davenport C. Safe Sleep Space: Step-by-Step Guide to Settling Babies 0 - 12 months DVD. Melbourne: ERC Media, The Royal Children's Hospital; 2009.
131. Stevens H. Early Parent and Infant Consultants. [cited; Available from: [www.parentandinfant.com.au](http://www.parentandinfant.com.au)
132. Victorian State Government Department of Education and Early Childhood Development. Maternal and Child Health Line. December 2009 [cited 2 August 2010; Available from: <http://www.education.vic.gov.au/ecsmanagement/mch/childhealthrecord/contact.htm>
133. Parent Line. Parenting Information - Babies. 2009 [cited 6 August 2010; Available from: <http://www.parentline.com.au/parenting-information/babies.php>
134. Victorian State Government Department of Health. Nurse-on-Call. 2010 May 2010 [cited 2010 11 August ]; Available from: <http://www.health.vic.gov.au/nurseoncall/>
135. Bromfield L, Holzer P. A national approach for child protection - Project Report Commissioned by the Community and Disability Services Ministers' Advisory Council. In: Australian Government Department of Families CSaIA-, editor.: National Child Protection Clearinghouse, Australian Institute of Family Studies; 2008.
136. McKenna JJ, McDade T. Why babies should never sleep alone: a review of the co-sleeping controversy in relation to SIDS, bedsharing and breast feeding. *Paediatr Respir Rev*. 2005;6(2):134-52.
137. SIDS and Kids Victoria. SIDS: Safe Sleeping. [cited 26 July 2010; Available from: <http://sidsandkidsvic.org/>
138. Bowlby J. The nature of the child's tie to his mother. *Int J Psychoanal*. 1958;39:350-73.
139. Ainsworth M, Bowlby J. Child Care and the Growth of Love. London: Penguin Books; 1965

140. Daws D. *Through The Night: Helping Parents and Sleepless Infants*. 1993 ed. London: Free Association Books; 1989.
141. Winnicott DW. *Babies and their Mothers*. Londone: Free Association Books; 1988.
142. Jordan B. Authoritative knowledge and its construction. In: Davis-Floyd RE, Sargent CF, editors. *Childbirth and Authoritative Knowledge*. Berkeley: University of California Press; 1997. p. 55-79.
143. Hofacker NV, Papoušek M. Disorders of excessive crying, feeding, and sleeping: the Munich Interdisciplinary Research and Intervention Program. *Infant Mental Health Journal*. 1998;19(2):180-201.
144. Government of South Australia SA Health. Children Youth and Women's Health Services (CYWHS). 2008 3 September 2010 [cited 8 September 2010; Available from: <http://www.cyh.com/HealthTopics/HealthTopicCategories.aspx?p=141>]
145. NCAST. Keys to caregiving program. [cited; Available from: [http://www.ncast.org/index.cfm?fuseaction=category.display&category\\_ID=18](http://www.ncast.org/index.cfm?fuseaction=category.display&category_ID=18)]
146. van den Boom DC. The Influence of Temperament and Mothering on Attachment and Exploration: An Experimental Manipulation of Sensitive Responsiveness among Lower-Class Mothers with Irritable Infants. *Child Dev*. 1994;65:1457-77.
147. Jordan B, Heine RG, Meehan M, Catto-Smith AG, Lubitz L. Effect of antireflux medication, placebo and infant mental health intervention on persistent crying: a randomized clinical trial. *J Paediatr Child Health*. 2006 2006;42(1-2):49-58.
148. Brazelton TB. *Neonatal Behavioral Assessment Scale*. Philadelphia: J.B.Lippincott; 1973.
149. Hiscock H, Wake M. Randomised controlled trial of behavioural infant sleep intervention to improve infant sleep and maternal mood. *Br Med J*. 2002;324(7345):1062-6.
150. Hiscock H, Bayer J, Gold L, Hampton A, Ukoumunne O, Wake M. Improving infant sleep and maternal mental health: a cluster randomised trial. *Arch Dis Child*. 2007;92:952-8.
151. Matthey S, Speyer J. Changes in unsettled infant sleep and maternal mood following admission to a parentcraft residential unit. *Early Hum Dev*. 2008;84:623 - 9.
152. Fisher J, Feekery C, Rowe H. Psycho-educational Early Parenting Interventions to Promote Infant Mental Health. In: Fitzgerald H, editor. *International Perspectives on Child Psychology and Mental Health*. Santa Barbara: ABC-CLIO Inc; In press.
153. Armstrong K, Fraser J, Dadds M, Morris J. Promoting secure attachment, maternal mood and child health in a vulnerable population: A randomized controlled trial. *Journal of Paediatric and Child Health*. 2000;36:555-62.
154. Fisher J, Feekery C, Rowe H. Treatment of maternal mood disorder and infant behaviour disturbance in an Australian private mothercraft unit: a follow-up study. *Archives of Women's Mental Health*. 2003;7(Suppl 1):s1-s5,.
155. Rowe H, Fisher J. The contribution of Australian residential early parenting centres to comprehensive mental health care for mothers of infants: Evidence from a prospective study. *Int J Ment Health Syst*. (in press).
156. Lovibond SH, Lovibond PF. *Manual for the Depression Anxiety Stress Scales*. 2nd ed. Sydney Psychology Foundation of Australia; 1995.
157. Leerkes EM, Blankson AN, O'Brien M. Differential Effects Of Maternal Sensitivity To Infant Distress And Non-Distress On Social-Emotional Functioning. *Child Dev*. 2009;80(3):762-75.
158. Australian Association for Infant Mental Health Inc. Position Paper 1: Controlled Crying. 2004 [cited 26 July 2010; Available from: <http://www.aaimhi.org/>]

159. Victorian Government Department of Education and Early Childhood Development Office for Children and Early Childhood Development. Maternal and Child Health Service: Practice Guidelines 2009 [cited; Available from: [http://www.eduweb.vic.gov.au/edulibrary/public/earlychildhood/mch/MCHprac\\_guidelines09.pdf](http://www.eduweb.vic.gov.au/edulibrary/public/earlychildhood/mch/MCHprac_guidelines09.pdf)
160. Royal Children's Hospital Centre for Community Child Health. Settling and Sleep Problems: Practice Resource. 2006 [cited; Available from: [www.rch.org.au/ccch](http://www.rch.org.au/ccch)
161. The Children's Hospital Westmead Sydney. The Crying Baby Factsheet. 2010 [cited 6 August 2010; Available from: <http://www.chw.edu.au/parents/factsheets/cryj.htm>
162. Circle of Security. Early Intervention Program for Parents and Children. [cited; Available from: <http://www.circleofsecurity.org/index.html>
163. Victorian State Government Department of Education and Early Childhood Development. Early Childhood 0-8. 2010 June 16, 2010 [cited 2 August 2010; Available from: <http://www.education.vic.gov.au/earlychildhood/default.htm>

# Appendix 1

## Participants in the roundtable consultation held on 19 November 2009 in Melbourne

- Ms Vivienne Amery**, Chief Executive Officer, Tweddle Child and Family Health Service
- Dr Lisa Amir**, GP / Lactation Consultant, Senior Research Fellow, Centre for Women's Health, Gender and Society, University of Melbourne and Mother & Child Health Research, La Trobe University
- Professor Bryanne Barnett**, Infant and Perinatal Psychiatrist, Karitane, Sydney South West Area Health Service and University of New South Wales
- Dr Jordana Bayer**, Research Fellow, Centre for Community Child Health, Royal Children's Hospital, Murdoch Children's Research Institute
- Dr Sarah Blunden**, Centre for Sleep Research, University of SA; Paediatric Sleep Clinic
- Mr Warren Cann**, Executive Director, Parenting Research Centre
- Ms Anne Colahan**, Manager, Maternal & Child Health Service, Victorian Department of Education and Early Childhood Development
- Ms Norma Cowan**, Maternal Child Health Nurse, Mornington Peninsula Maternal and Child Health Service
- Dr Pam Douglas**, Department of General Practice, University of Queensland
- Associate Professor Jane Fisher**, Deputy Director, Centre for Women's Health, Gender and Society, University of Melbourne
- Dr Harriet Hiscock**, NHMRC Postdoctoral Research Fellow, Centre for Community Child Health, Royal Children's Hospital, Murdoch Children's Research Institute
- Associate Professor Brigid Jordan**, Centre for Community Child Health, Royal Children's Hospital, Murdoch Children's Research Institute
- Ms Rae Lawry**, Nurse Unit Manager, Mercy Health-O'Connell Family Centre
- Ms Maureen Minchin**, Infant feeding educator and author; founding member of the International and Australian Lactation Consultant Associations
- Dr Meg Montague**, Consultation Facilitator
- Ms Anita Moorhead**, Clinical Midwifery Consultant Lactation, Royal Women's Hospital, Melbourne
- Ms Pam Linke**, Australian Association for Infant Mental Health
- Ms Nicola Quin**, Service Operations Branch, Perinatal Mental Health, Victorian Department of Health
- Ms Leanne Raven**, Chief Executive Officer, Sids and Kids Australia
- Dr Heather Rowe**, Senior Research Fellow, Centre for Women's Health, Gender and Society, University of Melbourne
- Ms Helen Stevens**, MCHN, midwife, Early Parent and Infant Consultant, Safe Sleep Space home visiting service
- Ms Patsy Thean**, Unit Manager, Masada Private Hospital Mother Baby Unit
- Ms Chris Thompson**, Senior Project and Policy Advisor, Maternal Child Health Program, Victorian Department of Education and Early Childhood Development
- Ms Alaina Vaisey**, Research Officer, Centre for Women's Health, Gender and Society, University of Melbourne
- Ms Rae Walter**, Chief Executive Officer, Ngala, Western Australia, Chair, Australian Association for Parenting and Child Health