**Parent-Infant Sleep Behaviour**

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**Normal infant sleep**

Babies sleep very differently from adults:
- they don’t sleep only at night
- they don’t sleep all night
- they fall asleep differently
- have shorter sleep cycles
- experience much more REM (dreaming sleep).

- Newborns require 10-20 hours or so of sleep a day
- Sleep in 2-3 hour bouts
- Circadian rhythm (biological clock) emerges around 3rd month
- Newborn sleep cycle = 60 mins. Adults = 90 mins.
- Adults drop quickly into non-REM, early sleep cycles include little REM which increases to morning
- Infant drop 1st into REM then progress to non-REM after 20+ minutes
- From birth to 3 months 40-50% on infant sleep time is made up of REM – brain processing information acquired during wake-time

**Development of sleep time and REM sleep across the lifespan**

**Normal sleep patterns across studies**


**‘Sleeping through the night’**

Moore & Ucko (1957)
- 160 infants – defined ‘normal’ infant sleep
- ‘Sleeping through the night’ = 12-5am, in a separate room (no crying/fussing)
- 70% began to consolidate sleep at 3 months, half reverted back to night waking
- Majority not fed human milk
Henderson et al (2010) investigated infant sleep consolidation over 1st year
Compared 3 criteria for sleeping through the night

- Longitudinal data with repeated measures on 75 NZ infants from middle-income families
- 3 different criteria for 'sleeping through the night'

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<tr>
<th>Criterion 1</th>
<th>Criterion 2</th>
<th>Criterion 3</th>
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<td>24:00 to 5:00</td>
<td>8 hours</td>
<td>22:00 to 6:00</td>
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- 50% of babies met criterion 3 at 5 months.
- At 12 months 21 (28%) of infants did not yet meet criterion 3.
- No information on infant feeding type
- Other studies indicate formula-fed infants begin settling before breast-fed infants

Breastfeeding is correlated with more fragmented sleep at 6 months (Tikotsky et al 2006).
Breastfed infants have greater night-time sleep duration than formula-fed infants (9.05h) (Huang et al 2008).
Breastfeeding mothers obtain approx 40 mins more sleep per night than mothers who give formula (Doan et al 2007).
Montgomery-Downs et al (2010) examined the impact of breastfeeding on maternal sleep for 80 mothers between 2-12 postnatal weeks...

Montgomery-Downs et al (2010) Infant Feeding Methods, Maternal Sleep and Daytime Functioning Pediatrics 2010; 126; e1562

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Feeding type and maternal sleep

- Common belief suggests that because breastfed infants wake frequently to feed, mothers do too, and therefore both achieve less sleep.
- However it now appears that as they achieve the same or more sleep than formula feeding dyads, they return to sleep more quickly, or sleep during feeds.
- Perhaps a consequence of bed-sharing and/or soporific lactation hormones.

What about sleep training?

- At some point during their baby’s first months of life, many parents wonder whether there is something they could – even should – be doing to “help” their baby sleep longer, deeper, better, or through the night.

Making babies fit our busy lives...

Methods devised to ‘sleep train’ babies fall broadly into two groups:
- those designed to treat existing ‘sleep problems’: include ‘extinction’ methods (e.g. Cry-It-Out and Controlled Crying), prevent a baby being ‘rewarded’ with parents’ attention for crying whilst settling to sleep, or on waking during the night. Other methods which fall into this category include ‘Shush and Pat’, ‘Gradual Withdrawal’, etc.
- those designed to prevent ‘sleep problems’ from developing: focus on development of routines or schedules which are broadly designed to help babies differentiate between night-time as sleep time, and day-time as wake, play and feed time, and to develop a predictable ‘routine’.

Do they work?

- Yes. The majority of published studies (over 80%) report positive outcomes, regardless of method
- The greatest amount of support (in terms of number and quality of studies) exists for ‘extinction’ methods.
- Outcomes achieved = an increase in the amount of sleep mothers reported for their babies or themselves, or a decrease in the number of times babies woke during the night
- Most studies aim to reduce signalling rather than improve sleep
- No studies have found a lasting effect
- Most methods evaluated in clinical settings
- Many studies implement more than one method – unclear what causes the outcome
- No data on unintended consequences
- Another view of extinction methods = severing the survival-link between mother and baby
- “Every primate baby is designed to be physically attached to someone who will feed, protect, and care for it... they have been adapted over millions of years to expect nothing else” (Small, 1998)
- Euro-American societies are cross-culturally unusual in separating mothers and infants at night

Things to consider...

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Sleeping like a baby

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Solitary infant sleep = historically novel

- Prior to the early 20th century infant social sleep was normal practice
- "The bosom of the mother is the natural pillow of her offspring" Dr Conquest (1848)
- Dr Chavasse, in Advice to mothers (1839) recommended bed-sharing until an infant was weaned at 9 months

*The First Born* by Yorkshire artist Fred Elwell was painted in 1918 and hangs in Ferens Gallery, Kingston-upon-Hull

The importance of physical contact

- Harlow’s experiments into the social development of infant monkeys demonstrated how physical contact, warmth and comfort was of vital importance for normal infant development.
- Western fashions in infant care have changed much more rapidly than human infant evolutionary biology.

Altricial and precocial infants

- Mammals with altricial infants = cache strategy, multiple infants in a litter, develop in nest (safety & warmth), mother leaves infants to forage, feed infrequently (e.g. once or twice per day), high fat content milk
- Mammals with precocial infants = carry/follow strategy, one infant at a time, able to walk/cling shortly after birth, remains with mother (safety & warmth) while she forages, feed frequently and on demand (e.g. hourly), low fat/high sugar content milk

Cache vs. Carry

Where do human infants fit in?

- Single infants born with well developed internal and sensory organs (see, hear, call) = precocial
- Lactation characteristics of precocial mammals: milk = low fat content / high sugar, infants need to feed frequently
- Poorly developed neuromuscular control = unable to cling or follow
- Human infants = secondarily altricial because typical brain growth cannot be completed prior to birth due to pelvis shape
- Humans have 25% adult brain at birth compared to 50% for other primates etc.

Human babies expect close contact day and night