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PROMOTING AND SUPPORTING SLEEP HEALTH IN FAMILIES OF INFANTS

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ACKNOWLEDGEMENTS

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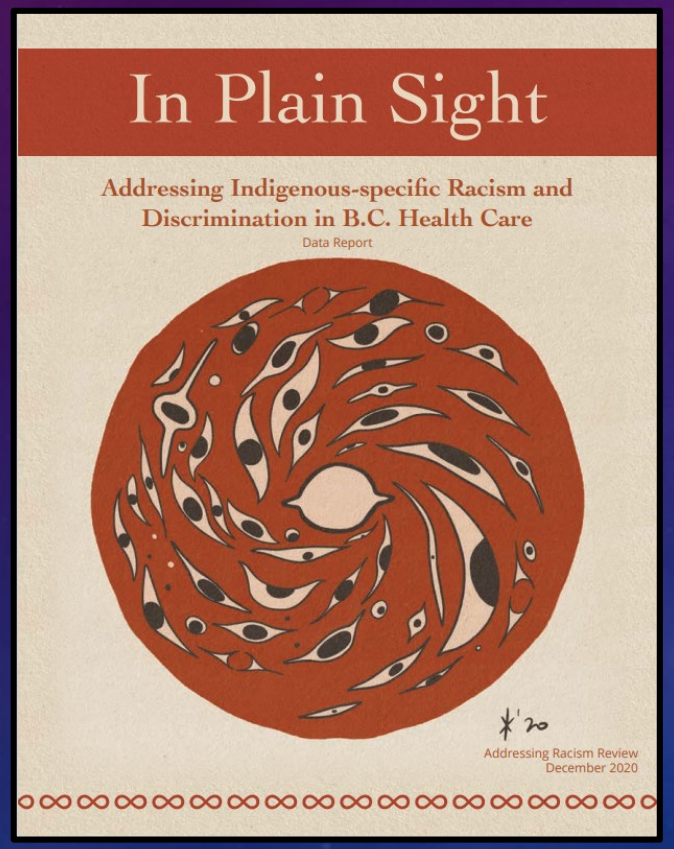

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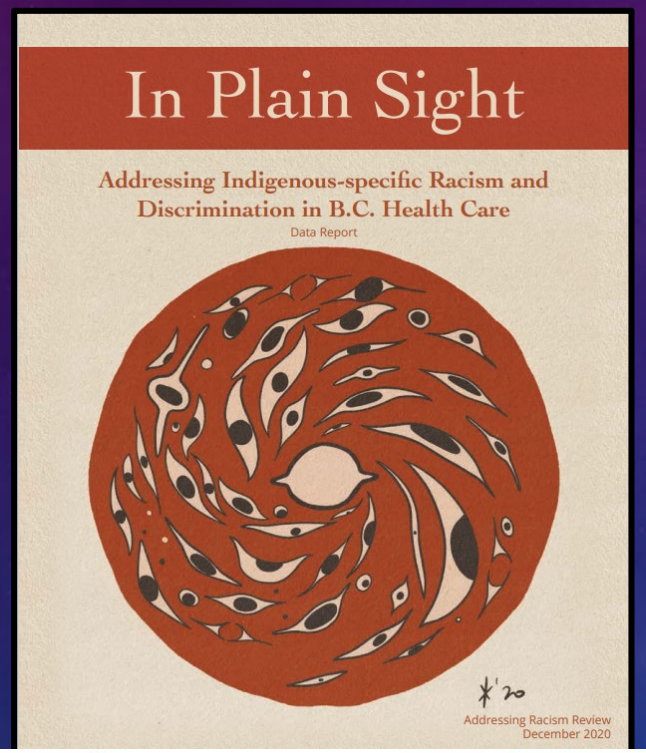
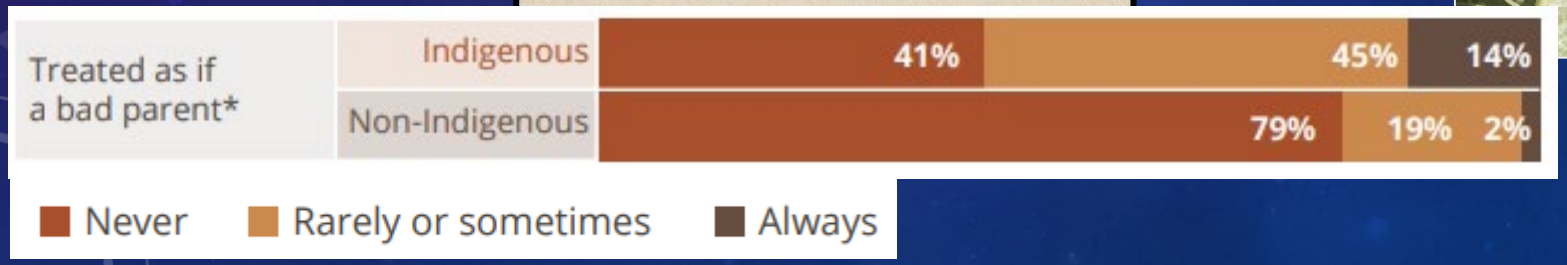
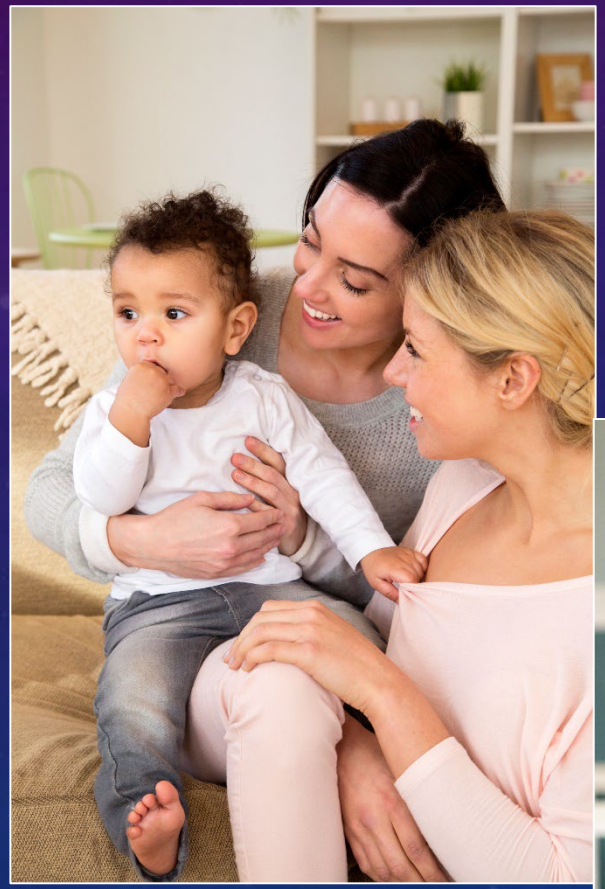




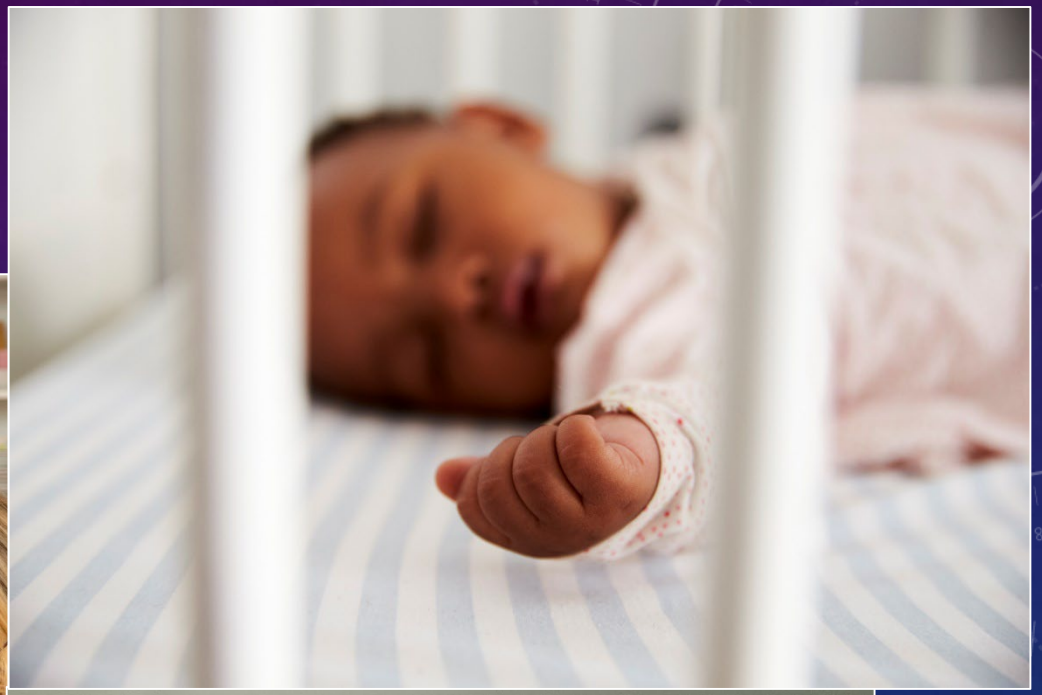
ACKNOWLEDGEMENTS

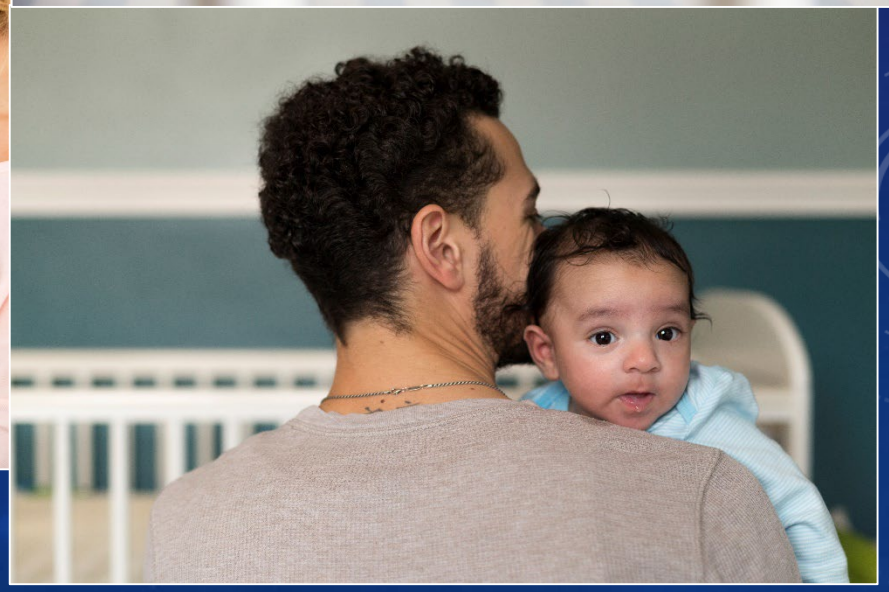
- Terminology

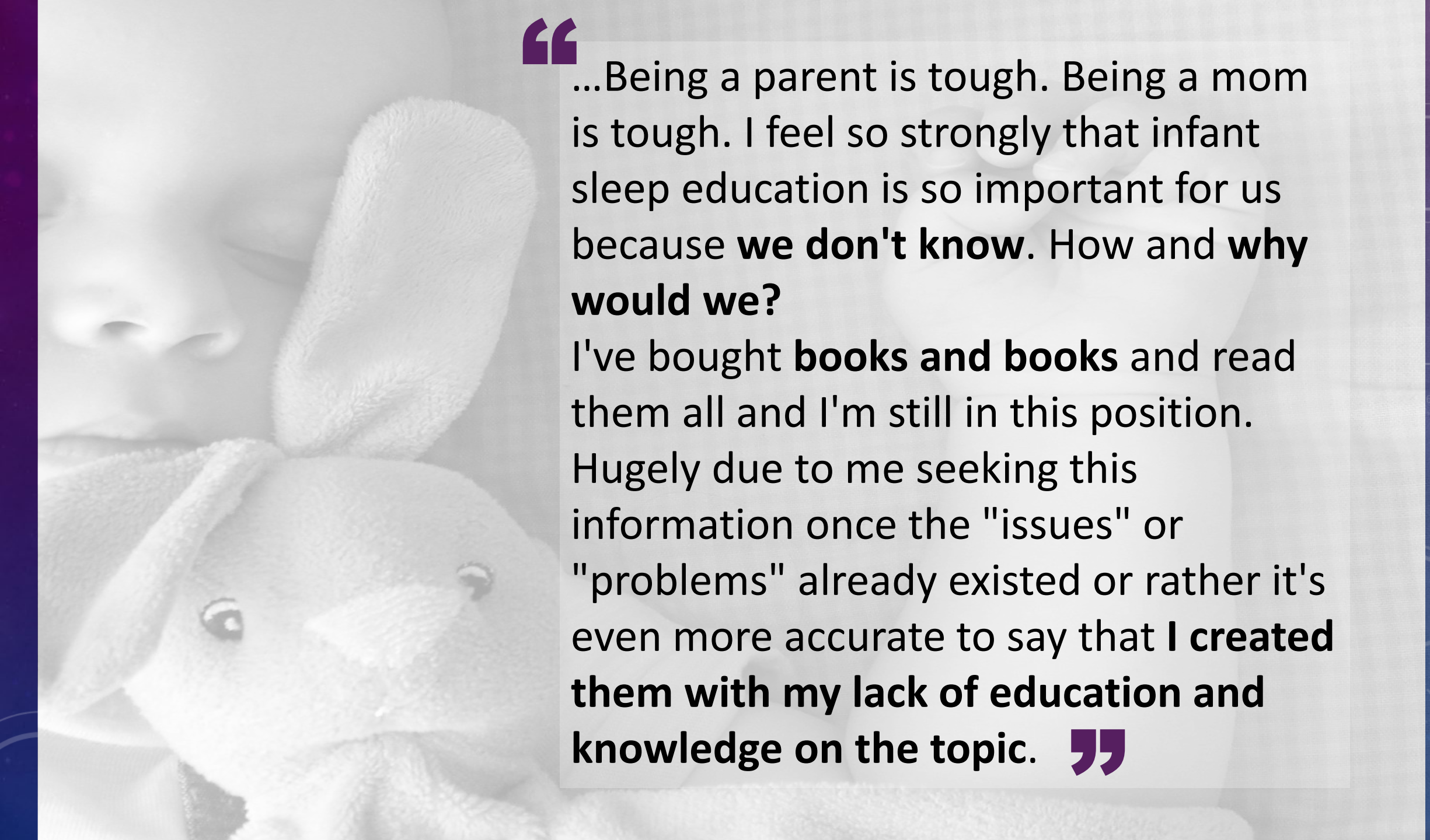


ACKNOWLEDGEMENTS

- Terminology
- Influences on existing research







“…Being a parent is tough. Being a mom is tough. I feel so strongly that infant sleep education is so important for us because **we don't know**. How and **why would we?**
I've bought **books and books** and read them all and I'm still in this position. Hugely due to me seeking this information once the "issues" or "problems" already existed or rather it's even more accurate to say that **I created them with my lack of education and knowledge on the topic**.”

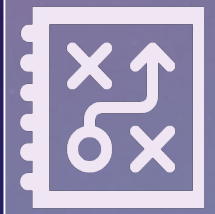
LEARNING OBJECTIVES

- Understand the reciprocal influences between sleep, infant and parental mental health, and child and family development.
- Consider key components and strategies for comprehensively assessing sleep health in families of infants.
- Describe a family-centered approach for supporting families to address concerns about infant sleep.
- Identify appropriate resources to enhance and advance their knowledge and practice about sleep health in families.

OVERVIEW

Foundational knowledge for sleep & sleep health

Assessing sleep health in families of infants



Supporting sleep concerns in families of infants

Additional resources & learning

WHAT IS SLEEP?

A state that you cannot avoid (eventually)

- **Infants:** Active, Quiet, and Indeterminate
- **Adults:** Stages 1 – 4; REM, NREM
  - Infants start to shift their sleep about 3-6 months

WHAT IS SLEEP?

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Alert States

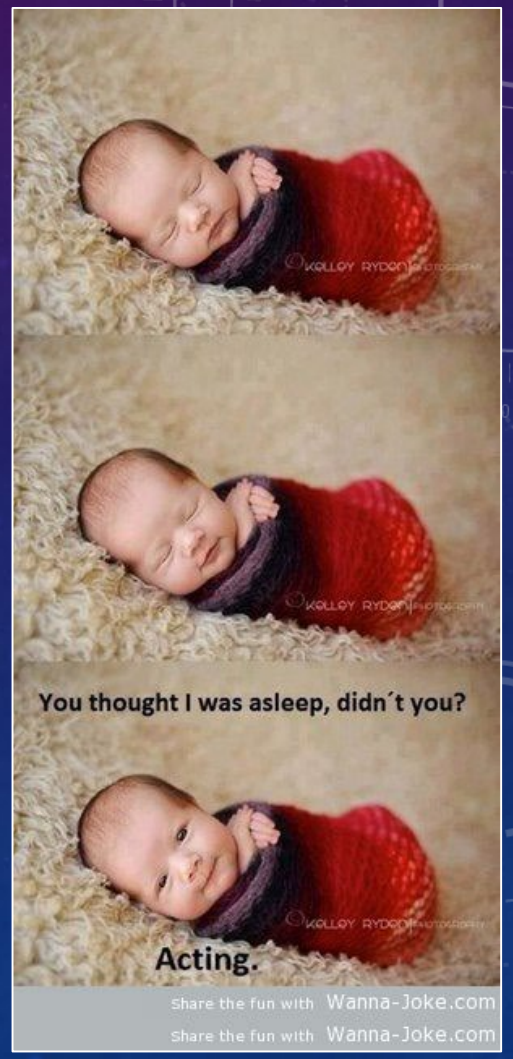
- Crying
- Active Alert
- Quiet Alert

Transitional states

- Drowsy

Sleep states

- Active Sleep
- Quiet Sleep



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- **Infants:** Active, Quiet, and Indeterminate
- **Adults:** Stages 1 – 4; REM, NREM
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The myth of sleeping through the night

- Adults wake up as they cycle through sleep (~90 minutes)
- Infants cycle between sleep states every 20 – 60 minutes
  - Sleep cycles lengthen as infant matures
- Transition to sleep (and falling back to sleep) is a learned behavior
  - This influences what conditions a person falls asleep

Alert States

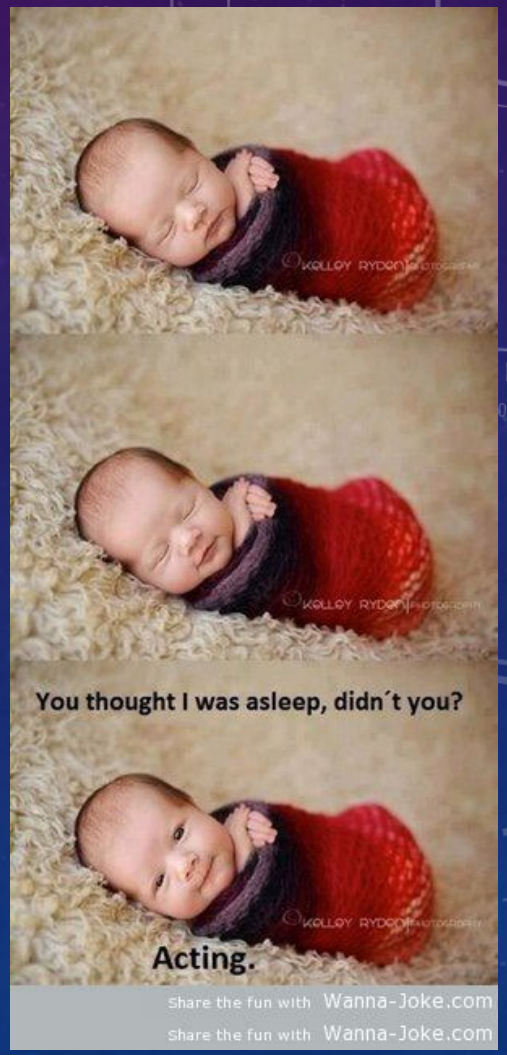
- Crying
- Active Alert
- Quiet Alert

Transitional states

- Drowsy

Sleep states

- Active Sleep
- Quiet Sleep



DEFINITION OF TERMS

- Sleep health – a construct that includes several sleep-related concepts (e.g., quality, duration, efficiency)
- Sleep hygiene – outdated; refers to sleep-related behaviors and environment
- Sleep pressure – the “pressure” to sleep that builds over periods of wakefulness; also known as homeostatic sleep drive
- Sleep regression – popularized term; does not exist in scientific literature
- Sleeping through the night – varying definitions depending on who you ask
- Insomnia – difficulties falling and staying asleep (behavioral sleep)
- Sleep training – popularized terms used to describe behavioral sleep strategies, including but not limited to extinction-based strategies such as graduated/modified extinction and camping out.

(Buysse, 2014; Meltzer, Williamson, & Mindell, 2021)

(Buysse, 2014; Meltzer, Williamson, & Mindell, 2021)

PEDIATRIC SLEEP HEALTH

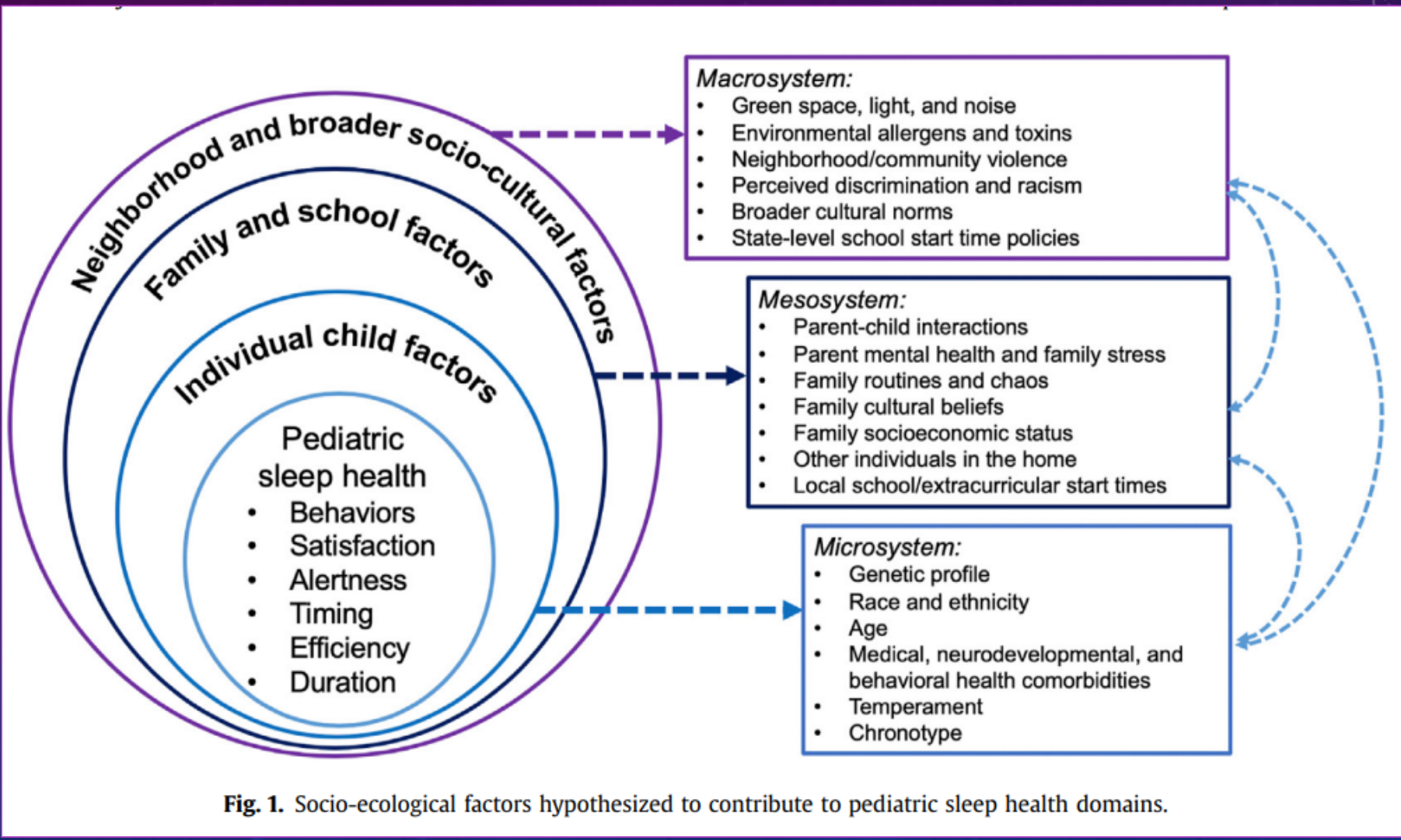
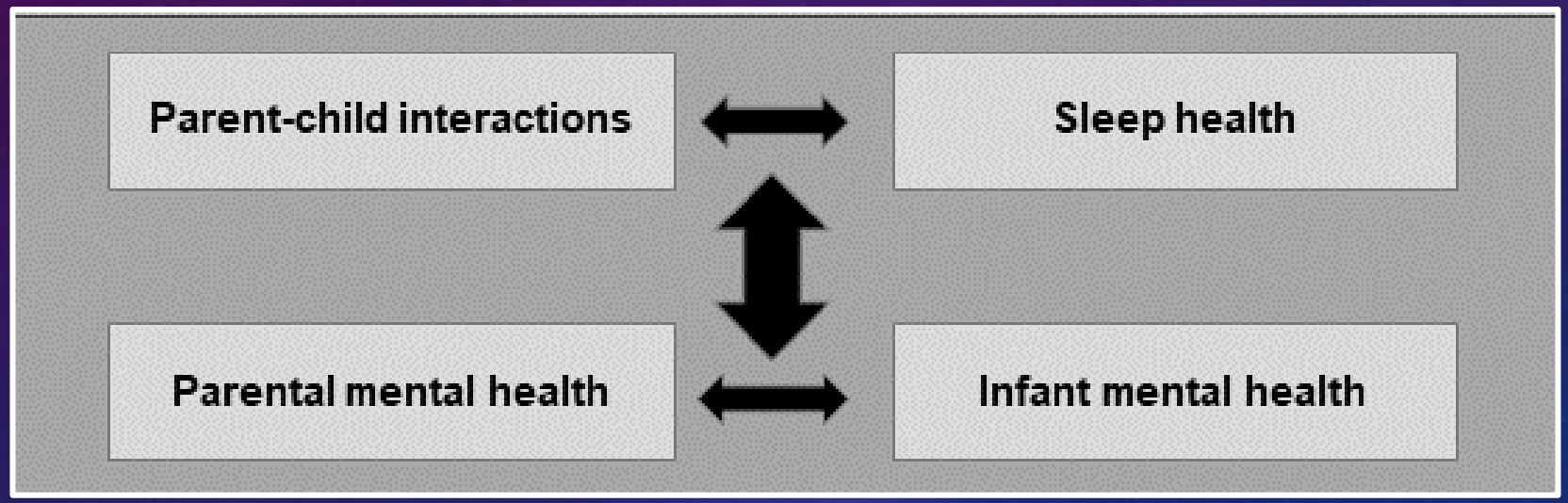


Fig. 1. Socio-ecological factors hypothesized to contribute to pediatric sleep health domains.

L.J. Meltzer, A.A. Williamson and J.A. Mindell Sleep Medicine Reviews 57 (2021) 101425

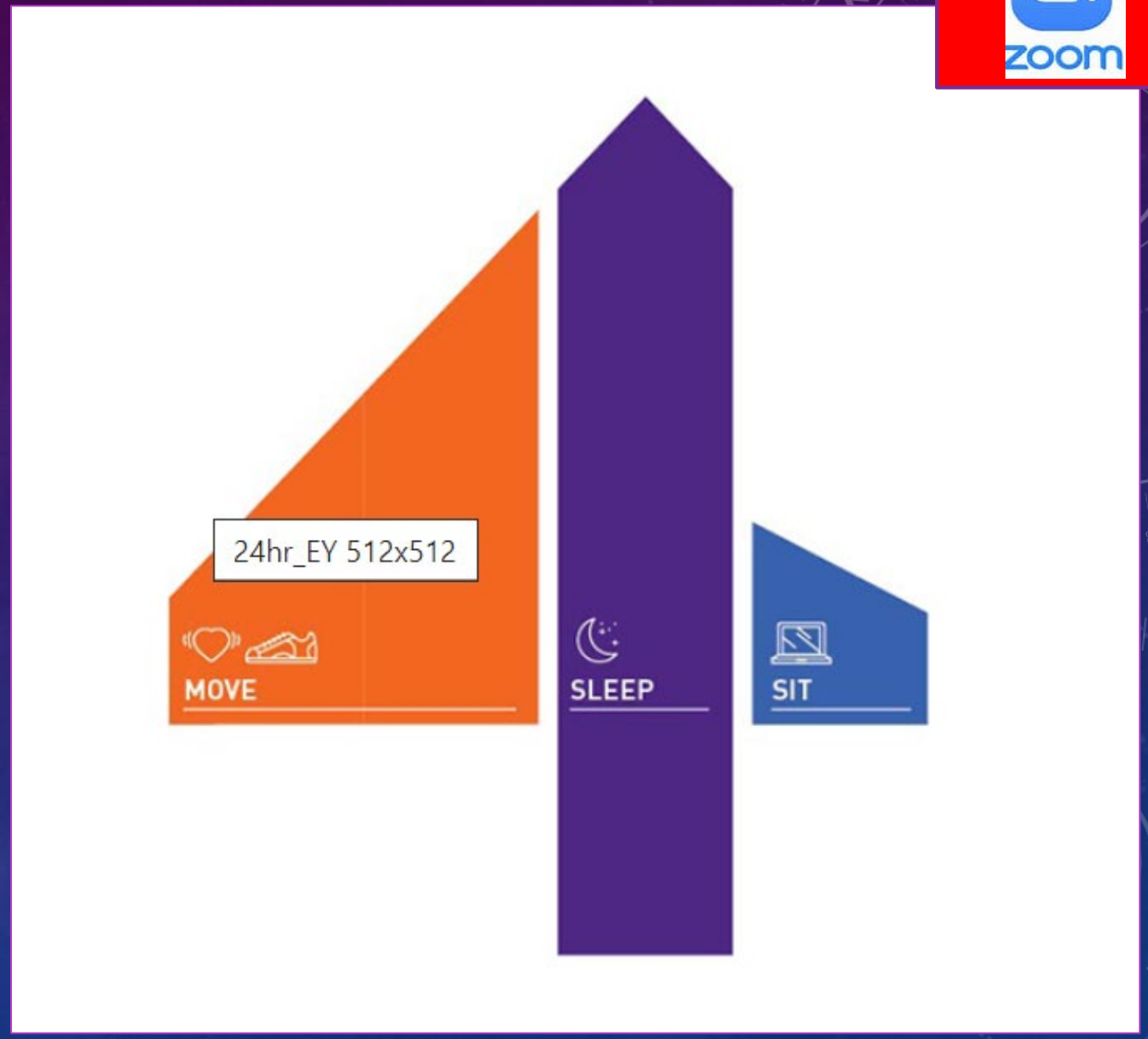
PEDIATRIC SLEEP HEALTH



PEDIATRIC SLEEP HEALTH
ADEQUATE DURATION

- Driven by “sleep pressure”, circadian rhythm, individual need (age)

- The recommended amount of sleep in a 24 hour period for a 6 month infant is?
  - 14 – 17 hours
  - 12 – 16 hours
  - 11 – 14 hours
  - 10 – 13 hours

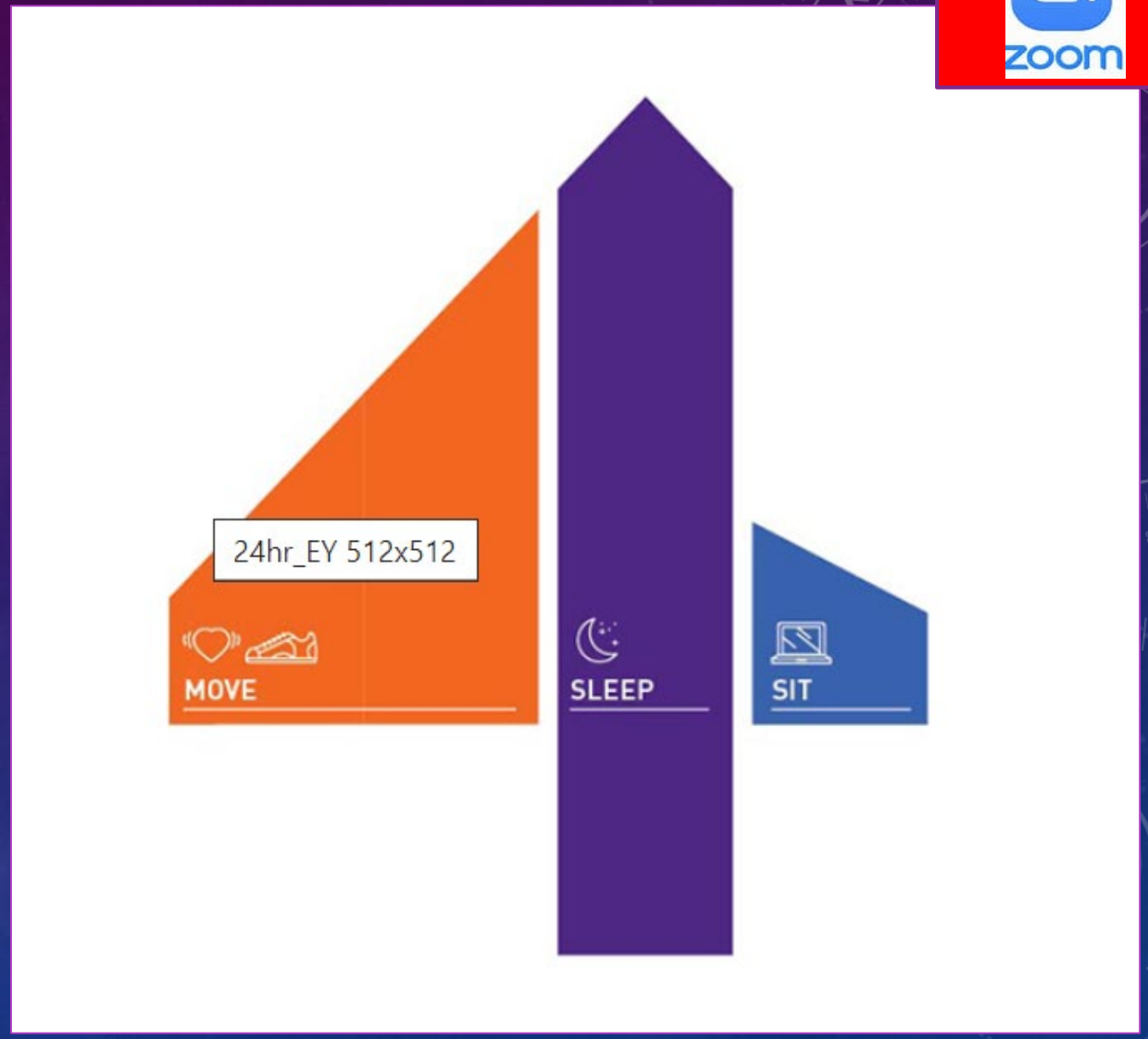


Canadian 24-Hour Movement Guidelines for the Early Years (0-4 years)
https://csepguidelines.ca/guidelines/early-years/

PEDIATRIC SLEEP HEALTH
ADEQUATE DURATION

- Driven by “sleep pressure” circadian rhythm, individual need (age)

- The recommended amount of sleep in a 24 hour period for a 6 month infant is?
  - 0 – 3 months: 14 – 17 hours
  - **4-11 months: 12 – 16 hours**
  - 1-2 years: 11 – 14 hours
  - 3-4 years: 10 – 13 hours



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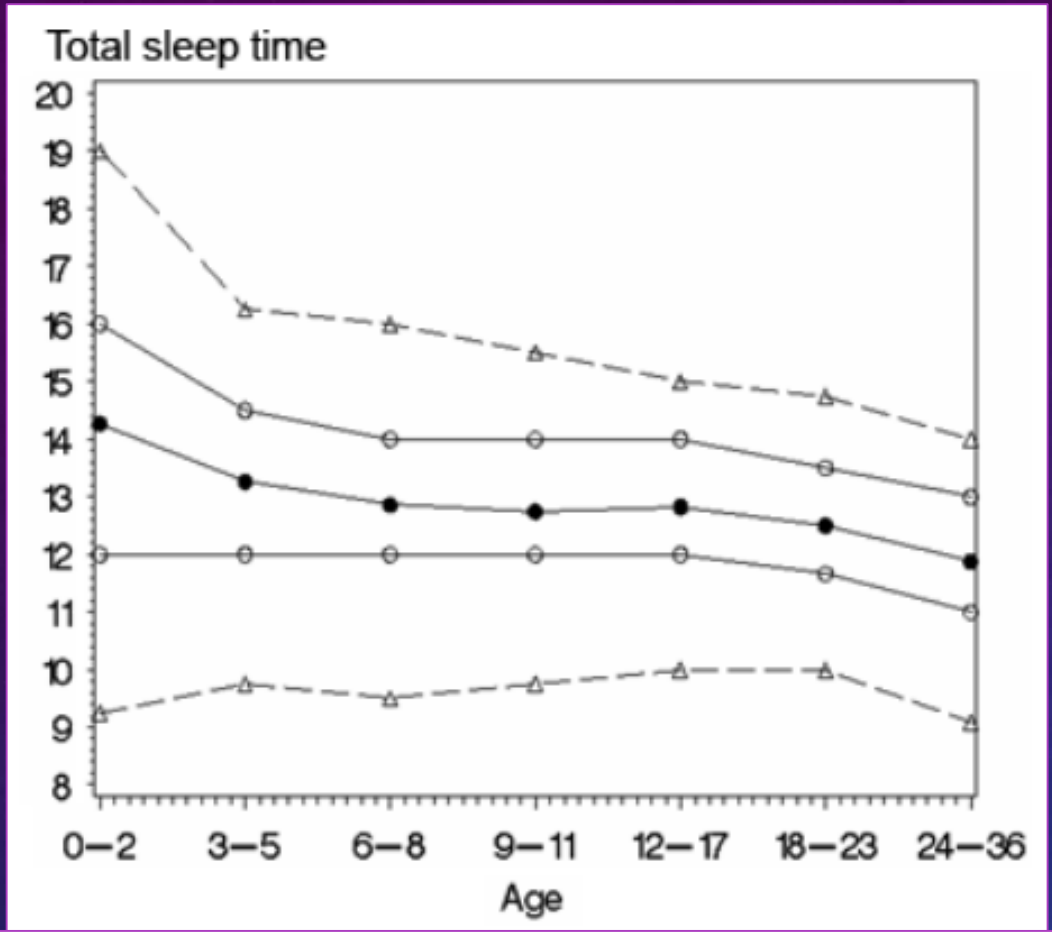


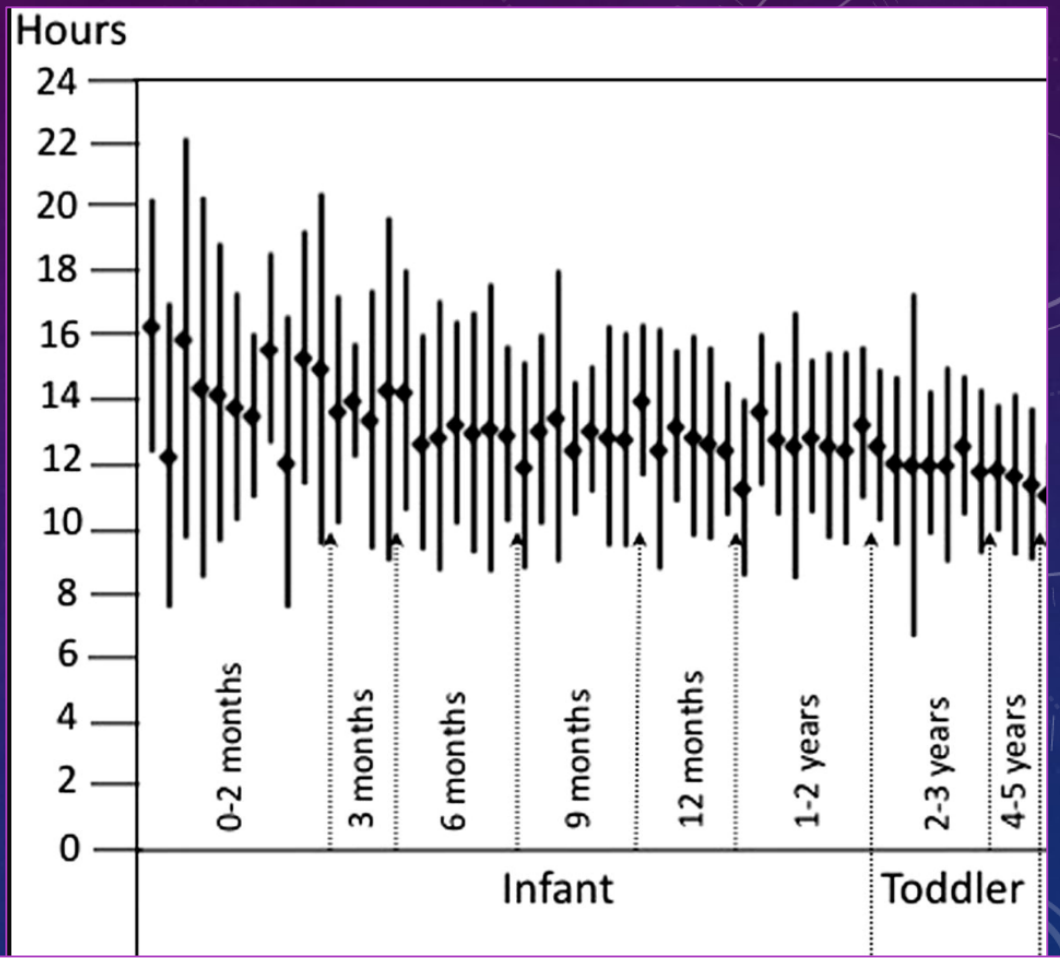
J. Sleep Res. (2009) 18, 60–73

Sleep in toddlers

doi: 10.1111/j.1365-2869.2008.00699.x

Sleep and sleep ecology in the first 3 years: a web-based study

AVI SADEH[1], JODI A. MINDELL[2], KATHRYN LUEDTKE[3] and BENJAMIN WIEGAND[3]



Sleep Medicine Reviews 16 (2012) 213–222

Contents lists available at ScienceDirect

Sleep Medicine Reviews

journal homepage: www.elsevier.com/locate/smrv

CLINICAL REVIEW

Normal sleep patterns in infants and children: A systematic review of observational studies

Barbara C. Galland[a,*], Barry J. Taylor[a,d], Dawn E. Elder[b,e], Peter Herbison[c,f]

PEDIATRIC SLEEP HEALTH

APPROPRIATE TIMING

PEDIATRIC SLEEP HEALTH

APPROPRIATE TIMING

You cannot force (or wish) someone to sleep

What causes people to sleep?

1. Homeostatic
    - “Sleep pressure” or how long a person has been awake
    - In the newborn period, this is the main driver of sleep

2. Circadian
    - “entrained” by environmental cues (light) and hormonal (cortisol, melatonin)
    - Some limited evidence that fetal rhythms may be synchronized to maternal rest-activity cycles

3. The “right” environmental conditions

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3. The “right” environmental conditions

By what age has the circadian rhythm usually developed?

A. In uteruo, 37 weeks
B. 2-3 months
C. 12-18 months
D. 11-13 years

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3. The “right” environmental conditions

By what age has the circadian rhythm usually developed?

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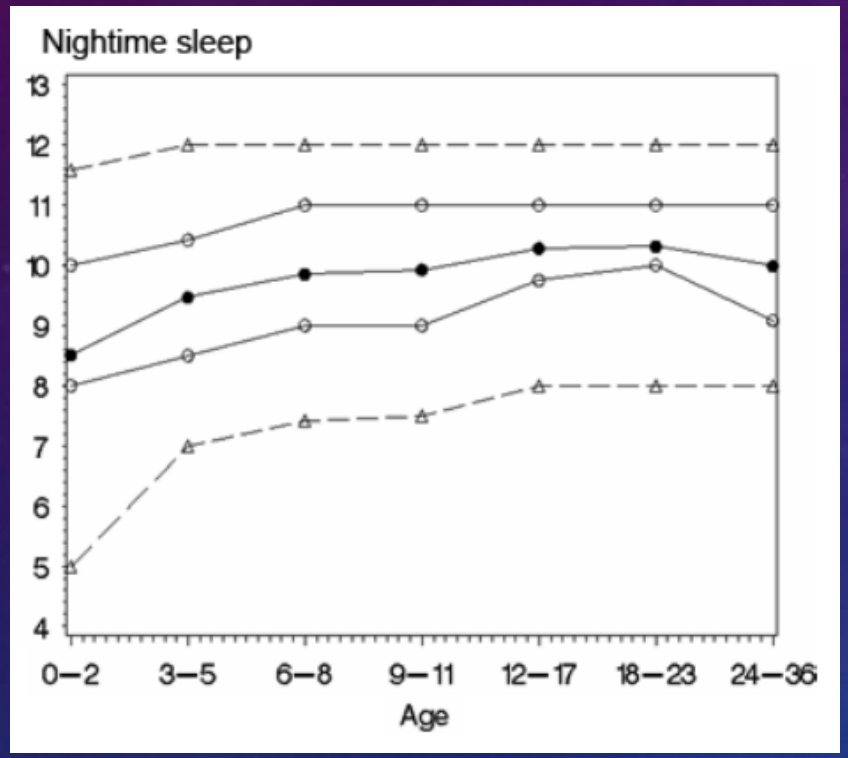
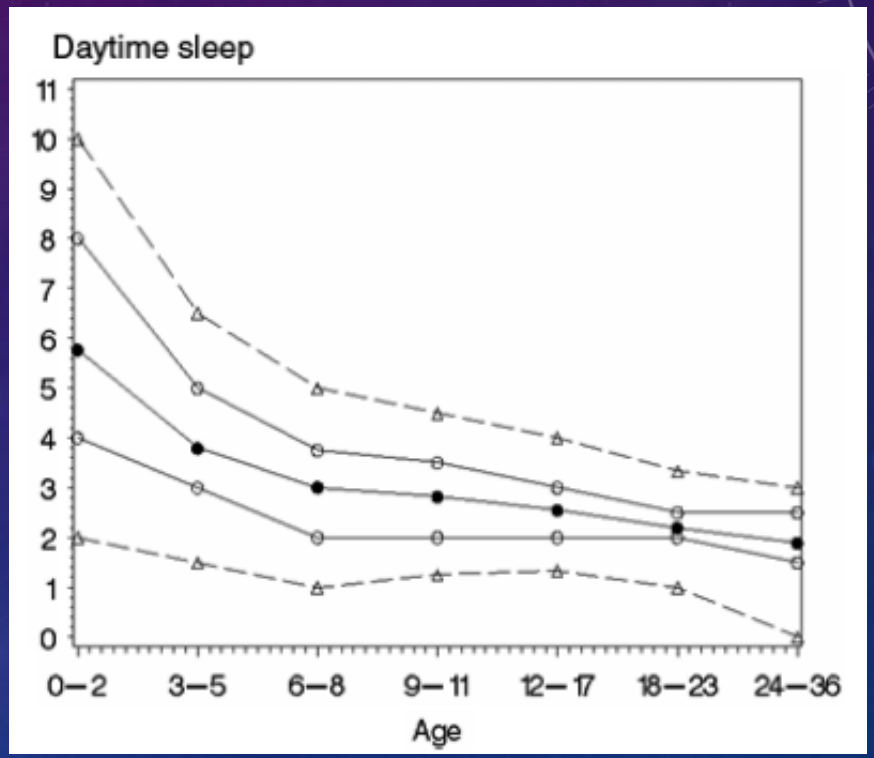
B. 2-3 months
C. 12-18 months
D. 11-13 years

The circadian rhythm is not well-developed in newborns – usually developed by 2 – 3 months of age

PEDIATRIC SLEEP HEALTH

APPROPRIATE TIMING: CONSOLIDATION OF SLEEP FROM DAY TO NIGHT AND INTO LONGER SLEEP PERIODS





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APPROPRIATE TIMING

SLEEPING “THROUGH THE NIGHT”

What percent of infants are “sleeping through the night” at 6 months of age?

A) 33%
B) 50%
C) 80%
D) It depends how you define “sleeping through the night”

APPROPRIATE TIMING

SLEEPING “THROUGH THE NIGHT”

What percent of infants are “sleeping through the night” at 6 months of age?

A) 33%

B) 55%

C) 85%

D) It depends how you define “sleeping through the night”

APPROPRIATE TIMING
SLEEPING "THROUGH THE NIGHT"

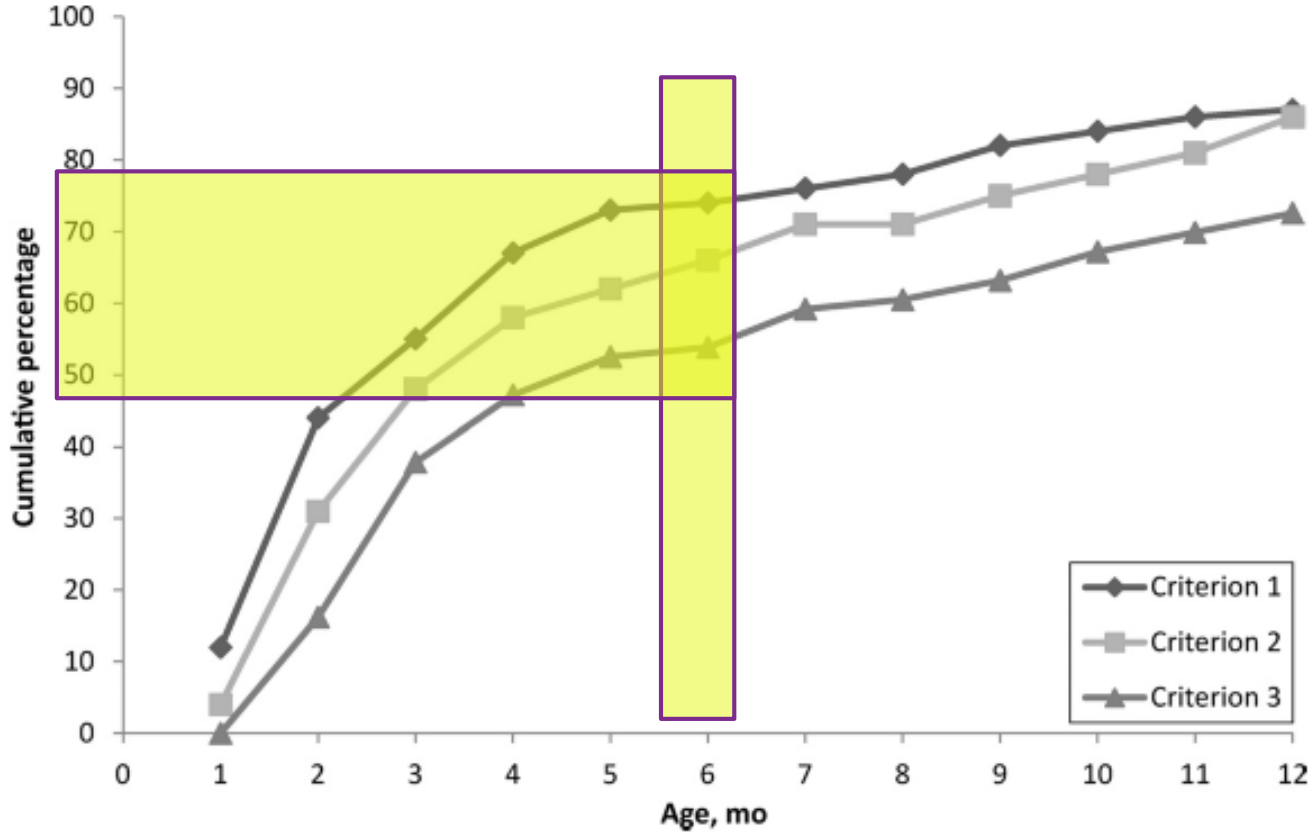


FIGURE 3
The cumulative percentage of infants who met criterion 1 (24:00–05:00 hours), criterion 2 (8 hours), and criterion 3 (22:00–06:00 hours) each month across the first year of life.

Henderson, J. M., France, K. G., Owens, J. L., & Blampied, N. M. (2010). Sleeping through the night: the consolidation of self-regulated sleep across the first year of life. *Pediatrics, 126(5), e1081-1087. doi:10.1542/peds.2010-0976*

PEDIATRIC SLEEP HEALTH
HIGH EFFICIENCY

Sleep Efficiency

- Amount of sleep a person actually gets DIVIDED by the total amount of time a person is sleeping and trying to sleep ("time in bed")
- In young children, can consider the amount of time it takes to fall asleep (or "put baby down") and the amount of time they spend awake during a sleep episode (might not necessarily be "in bed")
  - Sleep onset latency (nighttime) ranges from ~40 minutes (3 months) to 22 minutes (12 month)
    - 15 – 30 minutes is generally considered typical for most people
  - Nocturnal wakefulness (total duration of being awake during the night) ranges from 1.15 hr (+/- 1) for newborns to 20 minutes (+/- 30 minutes) for 9-11 months
- Connection with sleep timing (i.e., you cannot force someone to sleep), infant characteristics (e.g., age, temperament, clarity of cues) and environmental conditions (e..g, screen time exposure)

Chonchaiya, W., Wilaisakditipakorn, T., Vijakkhana, N., & Pruksananonda, C. (2017). Background media exposure prolongs nighttime sleep latency in Thai infants. Pediatric Research, 81(2), 322-328.
Paavonen, E. J., Saarenpää-Heikkilä, O., Morales-Munoz, I., Virta, M., Häkälä, N., Pölkki, P., Kylliäinen, A., Karlsson, H., Paunio, T., & Karlsson, L. (2020). Normal sleep development in infants: Findings from two large birth cohorts. Sleep Medicine, 69, 145-154. https://doi.org/10.1016/j.sleep.2020.01.009
Sadeh, Mindell, Luedtke, Wiegand. 2009. Sleep and sleep ecology in the first 3 years: A web-based study. *Journal of Sleep Research, 18, 60-73.* https://doi.org/10.1111/j.1365-2869.2008.00699.x

PEDIATRIC SLEEP HEALTH
HIGH EFFICIENCY

Example:

It takes Baby A 30 minutes to settle for a 40 minute nap

Baby A's "Sleep efficiency" = 40 minutes of actual sleep ÷ (40 minutes of sleep + 30 minutes of "time in bed" or "settling to sleep")

= 40 ÷ 70 = 0.57 = 57% sleep efficiency

It takes Baby B 10 minutes to settle for a 40 minute nap

Baby B's "Sleep efficiency" = 40 minutes of actual sleep ÷ (40 minutes of sleep + 10 minutes of "settling to sleep")

= 40 ÷ 50 = XX = XX% sleep efficiency

Does Baby B have greater sleep efficiency than Baby A? What Baby B's sleep efficiency?

PEDIATRIC SLEEP HEALTH

HIGH EFFICIENCY

Example:

It takes Baby A 30 minutes to settle for a 40 minute nap

Baby A's "Sleep efficiency" = 40 minutes of actual sleep ÷ (40 minutes of sleep + 30 minutes of "time in bed" or "settling to sleep")

= 40 ÷ 70 = 0.57 = 57% sleep efficiency

It takes Baby B 10 minutes to settle for a 40 minute nap

Baby B's "Sleep efficiency" = 40 minutes of actual sleep ÷ (40 minutes of sleep + 10 minutes of "settling to sleep")

= 40 ÷ 50 = **0.8 = 80% sleep efficiency**

Baby B's sleep efficiency is 80%, which is great than Baby A's.

PEDIATRIC SLEEP HEALTH

HIGH EFFICIENCY AND THE "LONGEST SELF-REGULATED SLEEP PERIOD"

10 hours

5 hours

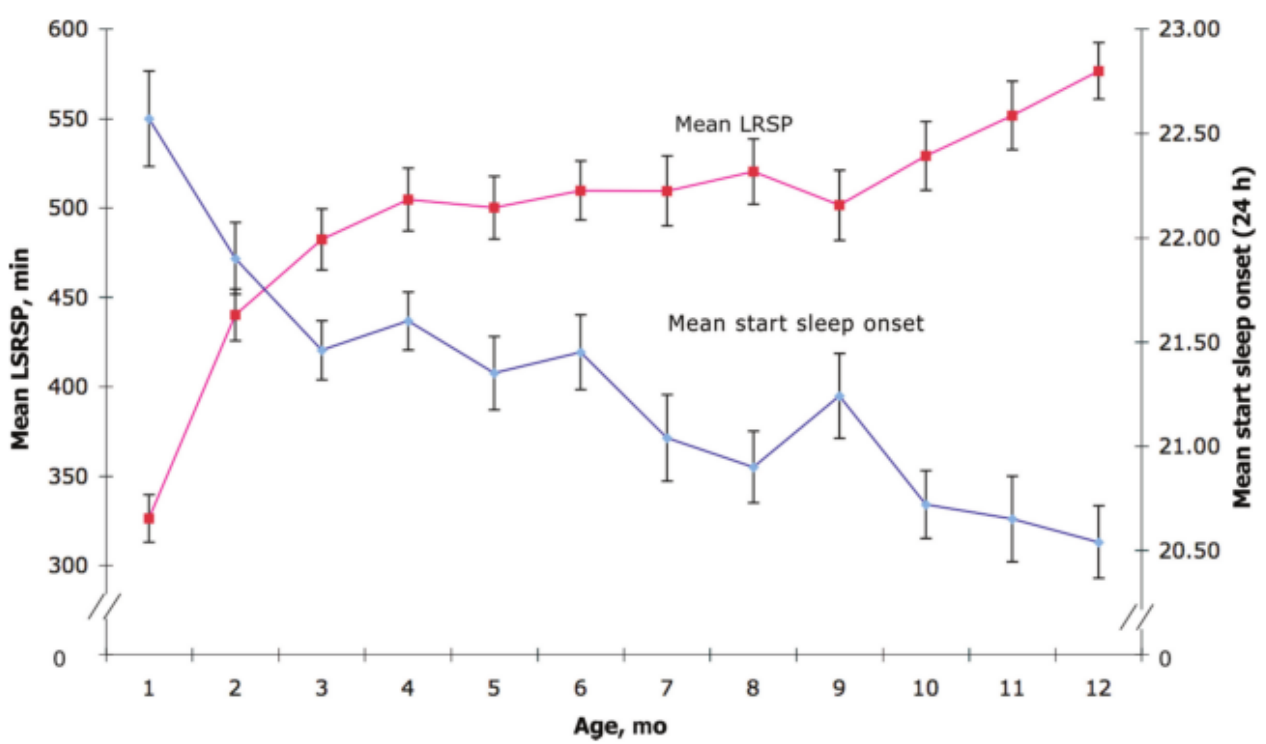


FIGURE 1
Mean start time of nocturnal sleep onset and mean LSRSP at each age in the first year of life. Bars at each data point represent the SEM.

Henderson, J. M., France, K. G., Owens, J. L., & Blampied, N. M. (2010). Sleeping through the night: the consolidation of self-regulated sleep across the first year of life. *Pediatrics, 126(5), e1081-1087. doi:10.1542/peds.2010-0976*

PEDIATRIC SLEEP HEALTH
ALERTNESS DURING WAKING HOURS

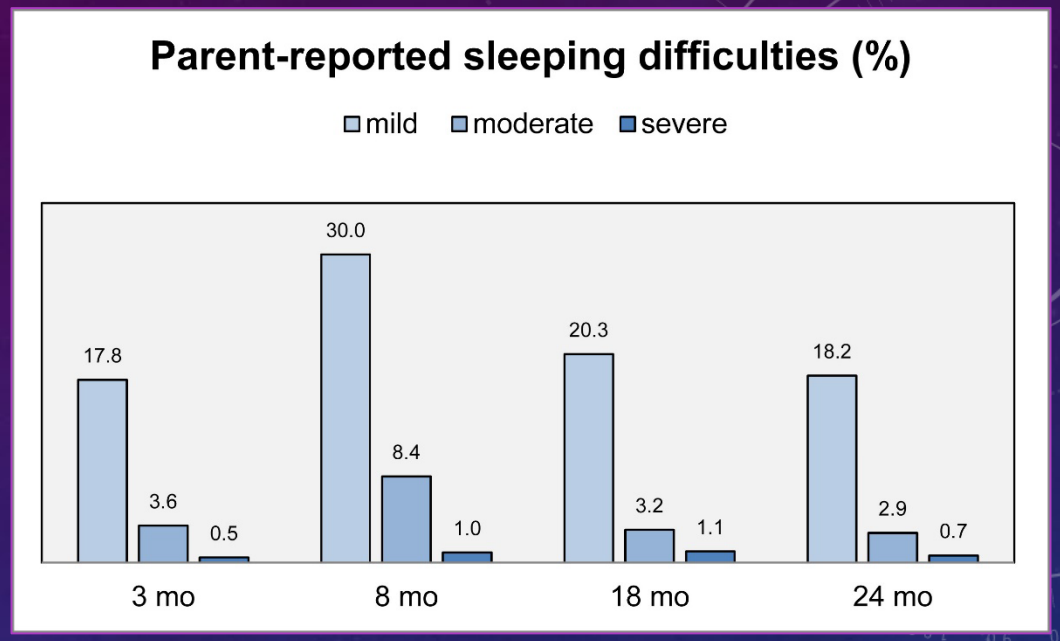
- Alertness impacts emotional regulation, behaviors (e.g., irritability, hyperactivity)
- Number of daytime naps decrease with age
  - 0-5 months: 3.1 (1.2 – 5.0)
  - 6-11 months: 2.2 (0.9 – 3.5)
  - 1 to 2 years: 1.2 (0.4 – 2.1)
- Periods of wakefulness may range from 1 – 4 hours, depending on infant age, environment, quality of previous sleep, etc.
- Between 8 - 12 months naps tend to cluster around 9:30 am and 2:00 pm
- Relates to sleep timing - sleep “window” or “sleep gate”
  - Watching for infant cues during awake period (more on this later!)

Galland, B. C., Taylor, B. J., Elder, D. E., & Herbison, P. (2012). Normal sleep patterns in infants and children: a systematic review of observational studies. Sleep medicine reviews, 16(3), 213-222.
Mindell, J. A., Leichman, E. S., Composto, J., Lee, C., Bhullar, B., & Walters, R. M. (2016). Development of infant and toddler sleep patterns: real-world data from a mobile application. Journal of sleep research, 25(5), 508-516.
Staton, S., Rankin, P. S., Harding, M., Smith, S. S., Westwood, E., LeBourgeois, M. K., & Thorpe, K. J. (2020). Many naps, one nap, none: A systematic review and meta-analysis of napping patterns in children 0–12 years. *Sleep medicine reviews*, *50*, 101247.

PEDIATRIC SLEEP HEALTH
SATISFACTION & QUALITY

- ~20 - 30% of parents will rate their infant's sleep as a problem
  - # of night wakings, sleep latency, and length of longest sleep period are best predictors

- Parental report of sleep does not always align with objective measures of sleep & can be affected by:
  - Parent-specific factors such as parental mood, behaviors, and perceptions of child
  - Socio-cultural context



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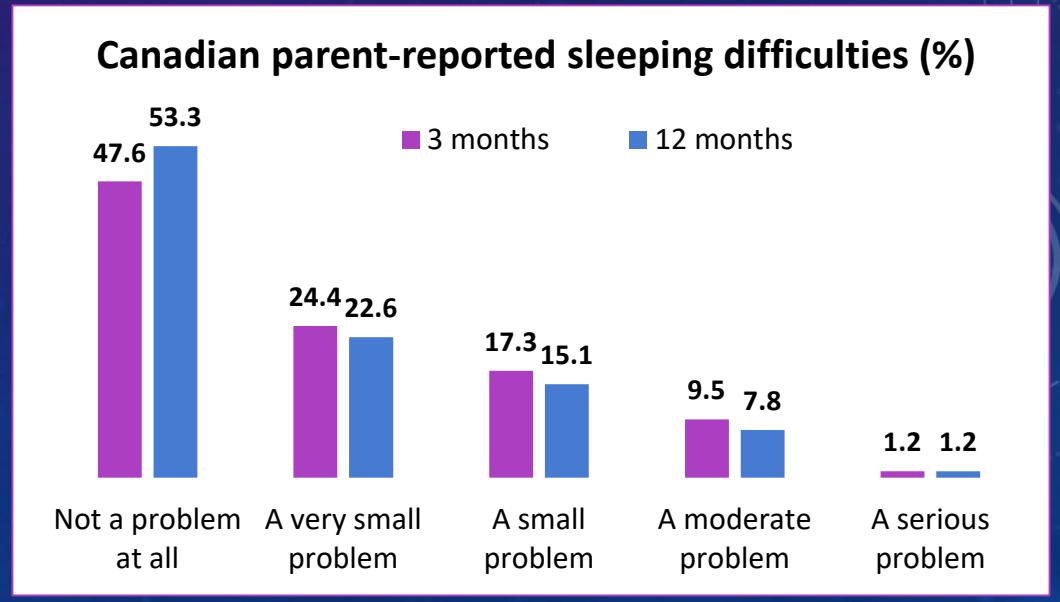
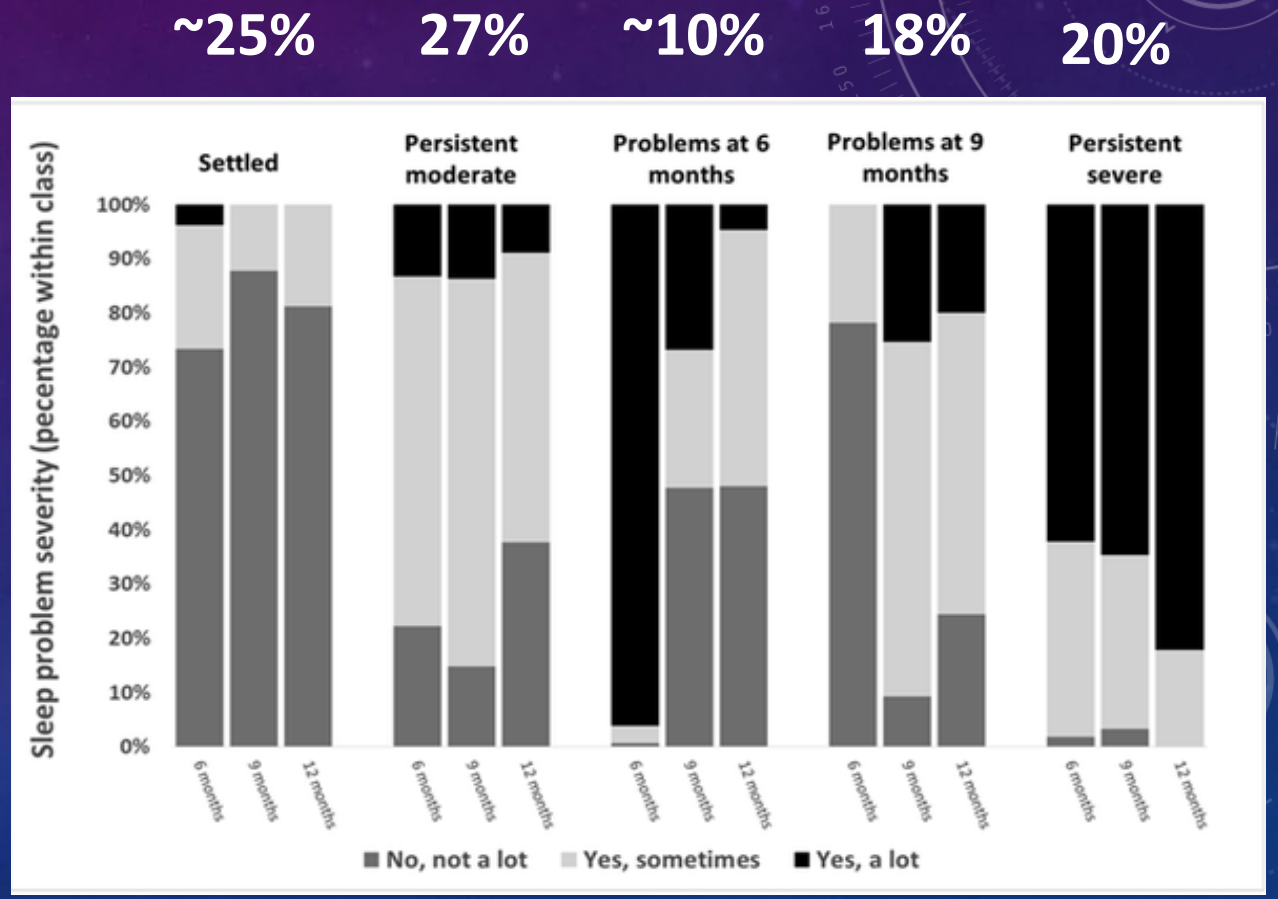


Giesbrecht, G. F., Bagshawe, M., van Sloten, M., MacKinnon, A. L., Dhillon, A., van de Wouw, M., ... & Tomfohr-Madsen, L. (2021). Protocol for the pregnancy during the covid-19 pandemic (pdp) study: a longitudinal cohort study of mental health among pregnant canadians during the covid-19 pandemic and developmental outcomes in their children. *JMIR research protocols*, *10*(4), e25407.
Sadeh, A. V. I., Mindell, J. A., Luedtke, K., & Wiegand, B. (2009). Sleep and sleep ecology in the first 3 years: a web-based study. *Journal of sleep research*, *18*(1), 60-73.

PEDIATRIC SLEEP HEALTH
SATISFACTION & QUALITY

Patterns of sleep quality over the 1st year:



Cook, F., Conway, L., Gartland, D., Giallo, R., Keys, E., & Brown, S. (2020). Profiles and predictors of infant sleep problems across the first year. *Journal of Developmental & Behavioral Pediatrics*, *41*(2), 104-116.

PEDIATRIC SLEEP HEALTH – SLEEP BEHAVIORS

Behaviors that can promote sleep in children

- Consistent and regular sleep opportunities; along with bedtime (pre-sleep) routine consistency
- Sleep-onset associations – how we learn to fall asleep and back to sleep
- Avoiding caffeine & exposure to light before and during sleep periods

ADDITIONAL CONSIDERATIONS FOR THE PERINATAL PERIOD

- Insomnia (difficulties falling and staying asleep) in pregnancy
  - Poll: How prevalent are insomnia symptoms during pregnancy?
    A. 100%
    B. 60%
    C. 40%
    D. 20%

Sedov, I. D., Anderson, N. J., Dhillon, A. K., & Tomfohr-Madsen, L. M. (2021). Insomnia symptoms during pregnancy: A meta-analysis. *Journal of sleep research*, *30*(1), e13207.

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    A. 100%
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    D. 20%

"Highest in third trimester (39.7%), compared to first (25.3%) and second (27.2%)"

Sedov, I. D., Anderson, N. J., Dhillon, A. K., & Tomfohr-Madsen, L. M. (2021). Insomnia symptoms during pregnancy: A meta-analysis. *Journal of sleep research*, *30*(1), e13207.

ADDITIONAL CONSIDERATIONS FOR THE PERINATAL PERIOD

- Insomnia (difficulties falling and staying asleep) is common in pregnancy (~40%)
- Rates of Restless Leg Syndrome / Willis ekbom disease in pregnancy are ~23%
- Nighttime infant caregiving is gendered
  - Involvement of parenting partners (e.g., fathers) typically associated with more positive sleep outcomes for both infants and mothers
- Goodness of fit between prenatal maternal sleep and infant sleep; associations with depression and attachment (Newland, Parade, Dickstein, and Seifer, 2016)

Sedov, I. D., Anderson, N. J., Dhillon, A. K., & Tomfohr-Madsen, L. M. (2021). Insomnia symptoms during pregnancy: A meta-analysis. *Journal of sleep research*, *30*(1), e13207. https://doi.org/10.1111/jsr.13207

Darvishi, N., Daneshkhah, A., Khaledi-Paveh, B., Vaisi-Raygani, A., Mohammadi, M., Salari, N., Darvishi, F., Abdi, A., & Jalali, R. (2020). The prevalence of Restless Legs Syndrome/Willis-ekbom disease (RLS/WED) in the third trimester of pregnancy: a systematic review. *BMC neurology*, *20*(1), 132. https://doi.org/10.1186/s12883-020-01709-0

Insana, S. P., Garfield, C. F., & Montgomery-Downs, H. E. (2014). A mixed-method examination of maternal and paternal nocturnal caregiving. Journal of Pediatric Health Care, 28(4), 313-321.

Tikotzky, L., Sadeh, A., & Glickman-Gavrieli, T. (2010). Infant sleep and paternal involvement in infant caregiving during the first 6 months of life. Journal of pediatric psychology, 36(1), 36-46.

ADDITIONAL CONSIDERATIONS FOR THE PERINATAL PERIOD

- Physical activity may help improve postpartum sleep, but findings are mixed (Vladutiu, Evenson, Borodulin, Deng, & Dole, 2014; Liu, Chang, Hung, & Chen, 2021; Uw, Einerson, Shaw, Nygaard, Sheng, Wolpern, & Egger, 2019)

- Infant nightwakings not significantly related to maternal caffeine intake (Santos, Matijasevich, & Domingues, 2012; McCreedy, Bird, Brown, Shaw-Stewart, & Chen, 2018)

- Some support that consuming DHA in pregnancy reduces arousals during newborn sleep (Judge, Conf, Harel, Courville, Lammi-Keefe, 2012)

ADDITIONAL CONSIDERATIONS FOR THE PERINATAL PERIOD

Mutual Regulation in Pregnancy to Self-Regulation

- Prenatal daily patterns may assist in infant's development of a daily rhythm and ability to self-regulate, but not strong evidence for this
- Pregnant people could keep a record of their daily patterns to reflect
  - Understanding baby's pattern in utero may be helpful for new parents, as the activity pattern usually continues for 2-4 weeks following birth

Barnard & Thomas (2014) Beginning Rhythms, NCAST Programs, University of Washington

ASSESSMENT OF SLEEP HEALTH

ASSESSMENT OF SLEEP HEALTH

- Is sleep a concern?
  - Relationship building and family context
- Assess factors that may be related to sleep
  - information from history, other assessments & interactions
- Tracking & monitoring sleep
- Questionnaires

ASSESSMENT OF SLEEP HEALTH

- Assessing if sleep is a concern
  - Relationship building and family context

"[T]o be honest there was a little bit of like guilt or shame with it, so I wasn't always honest.…

I remember at one of her vaccine appointments they asked how she was sleeping, and I didn't wanna get into it. "Oh yeah she's in her crib". Just that I didn't want the, not a lecture necessarily but the whole, you know that a crib is safer, and we don't recommend co-sleeping. Of course, I knew that but at the time I didn't feel like I had another option."

ASSESSMENT OF SLEEP HEALTH

- Assessing if sleep is a concern
  - Relationship building and family context

- Screening tool
  - BEARS sleep screening
  - **B**edtime issues, **E**xcessive daytime sleepiness, night **A**wakenings, **R**egularity and duration of sleep, **S**noring

Owens, J. A., & Dalzell, V. (2005). Use of the 'BEARS' sleep screening tool in a pediatric residents' continuity clinic: a pilot study. *Sleep medicine*, *6*(1), 63–69. https://doi.org/10.1016/j.sleep.2004.07.015

ASSESSMENT OF SLEEP HEALTH
ASSESS FACTORS THAT CAN INTERACT WITH SLEEP

What factors are related to sleep?

(choose all that apply)

1. Prematurity
2. Parental depression and anxiety
3. Family and household routines
4. Sleep-related beliefs and cultural practices

ASSESSMENT OF SLEEP HEALTH
ASSESS FACTORS THAT CAN INTERACT WITH SLEEP

Infant	Parental	Family	Socio-cultural
• Age & gestational age • Temperament • Co-morbidities (neurodevelopmental, feeding and weight gain concerns) • Ability to provide clear cues and respond	• Mental health (depression & anxiety) • Parental beliefs about sleep and crying • History of sleep difficulties • Medications & supplements	• Parent-child interactions (relationships) • Parenting partners and social supports • Family routines & schedules • Home characteristics	• Sleep-related beliefs • Parenting practices • Daylight savings

Snoring or breathing difficulties during sleep; feeding/weight gain concerns, and/or multiple regulatory concerns (feeding, sleeping, and/or crying)

ASSESSMENT OF SLEEP
TRACKING AND MONITORING OF SLEEP (WITH OR WITHOUT FEEDBACK)

Sleep diaries/logs can be used to assess different aspects of sleep health (duration, timing, efficiency, alertness)

Tracking sleep patterns can help parents (and HCPs) understand:

- Typical sleep patterns and whether these are within developmentally appropriate ranges
- Sleep-related behaviors
- Daytime and nighttime routines
- Changes in sleep over time

ASSESSMENT OF SLEEP
TRACKING AND MONITORING OF SLEEP (WITH OR WITHOUT FEEDBACK)

Many different hard-copy, printable, and app-based versions of sleep diaries – Usability is key!

- Consumer wearables are also becoming popular, but reliability and validity studies are limited
- About 5 days is typical (5-7 nights)

Can be helpful if includes information on :

- start & stop times for sleep periods
- # and length of wakings
- how long it took to settle (back) to sleep
- How /where fell asleep (and with whom)

Based on the sleep, feed, and play tracker, consider some of the components of sleep health…

Duration:

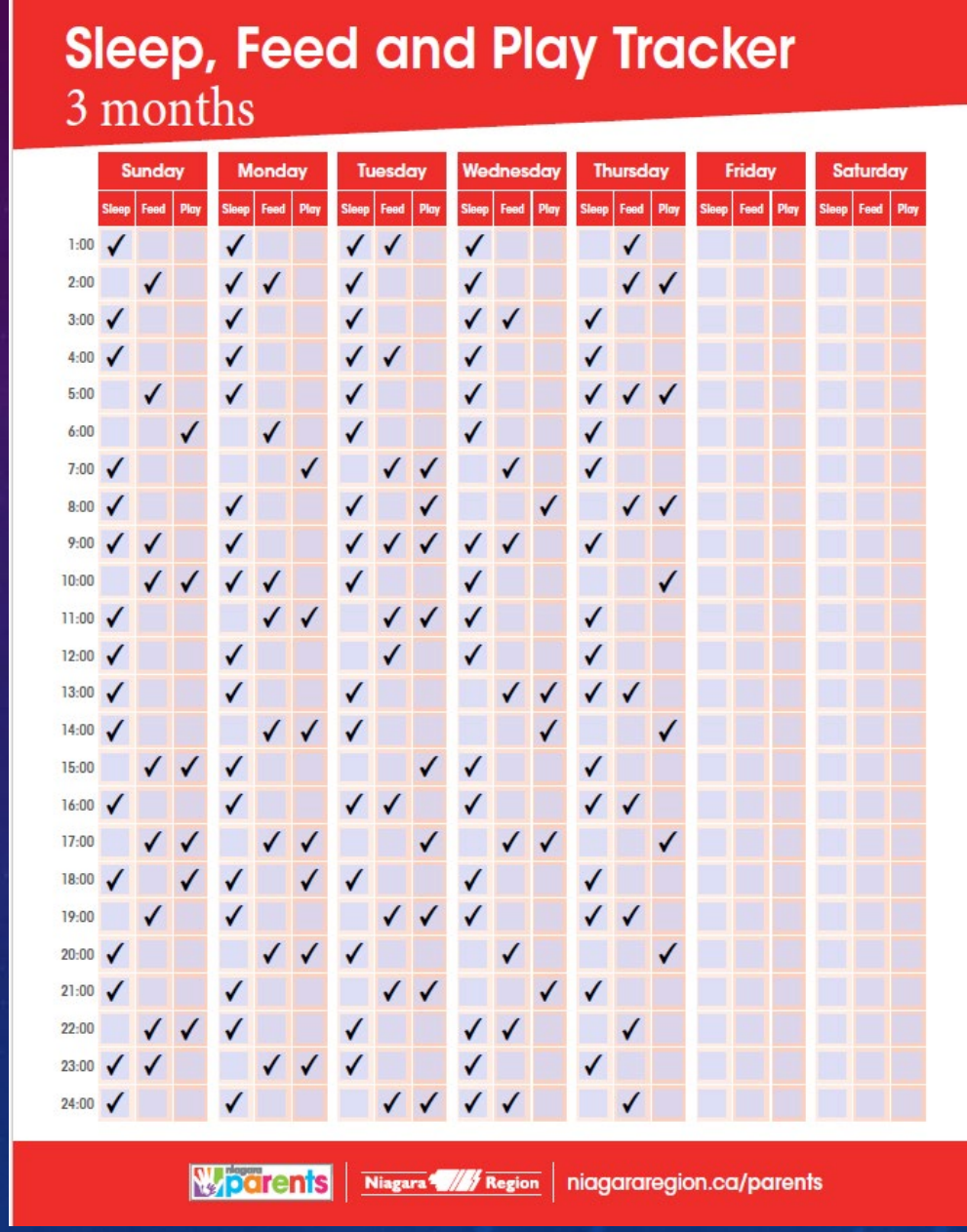
Timing:

Efficiency:

Alertness during the day:

Sleep behaviors:

Satisfaction and quality:



12 weeks postpartum,
(corrected age 9 weeks)

Based on the sleep, feed, and play tracker, consider some of the components of sleep health…

Duration: How many hours of sleep are they getting? Is this amount typical?

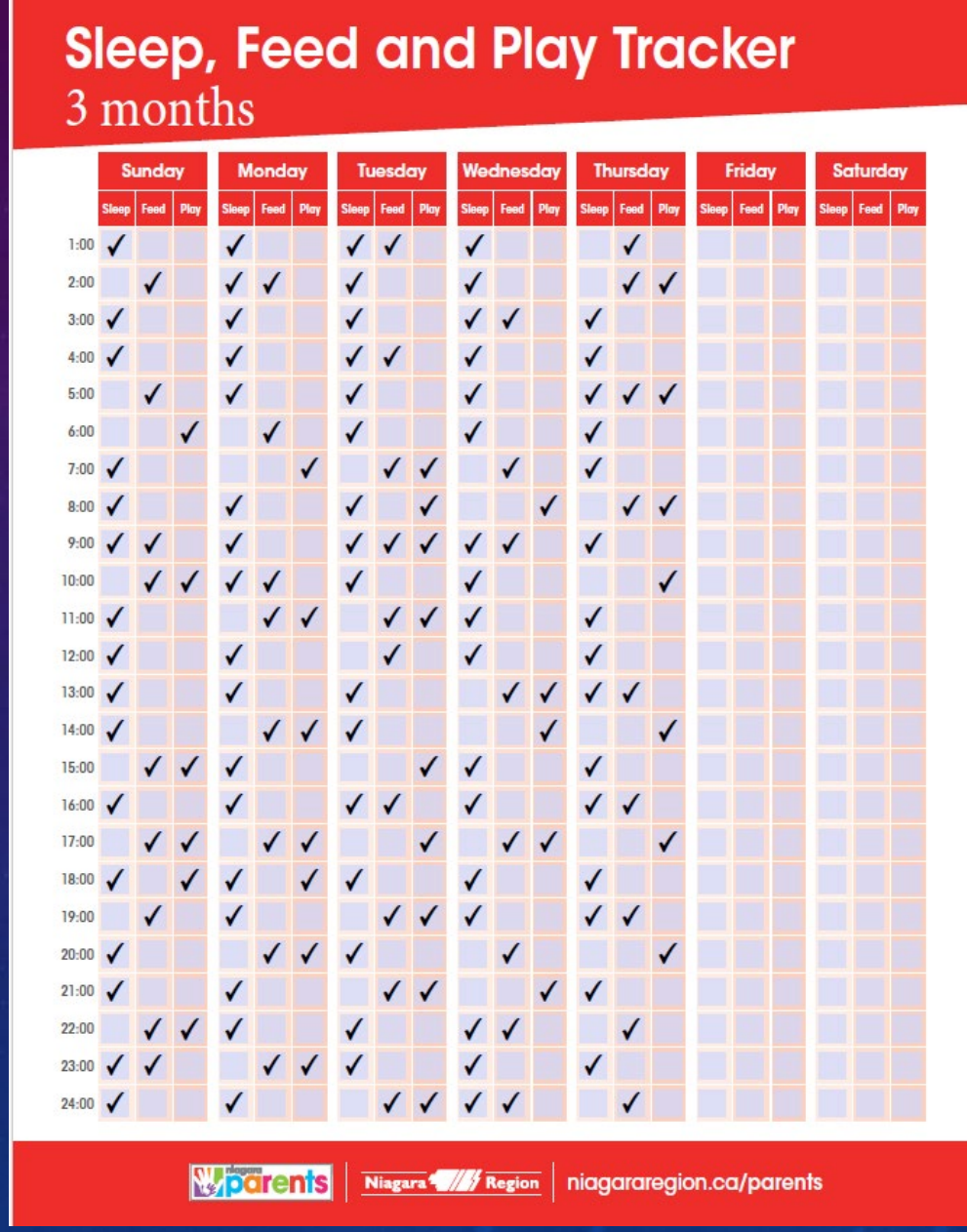
Timing:

Efficiency:

Alertness during the day:

Sleep behaviors:

Satisfaction and quality:



12 weeks postpartum,
(corrected age 9 weeks)

Based on the sleep, feed, and play tracker, consider some of the components of sleep health…

Duration: How many hours of sleep are they getting? Is this amount typical?

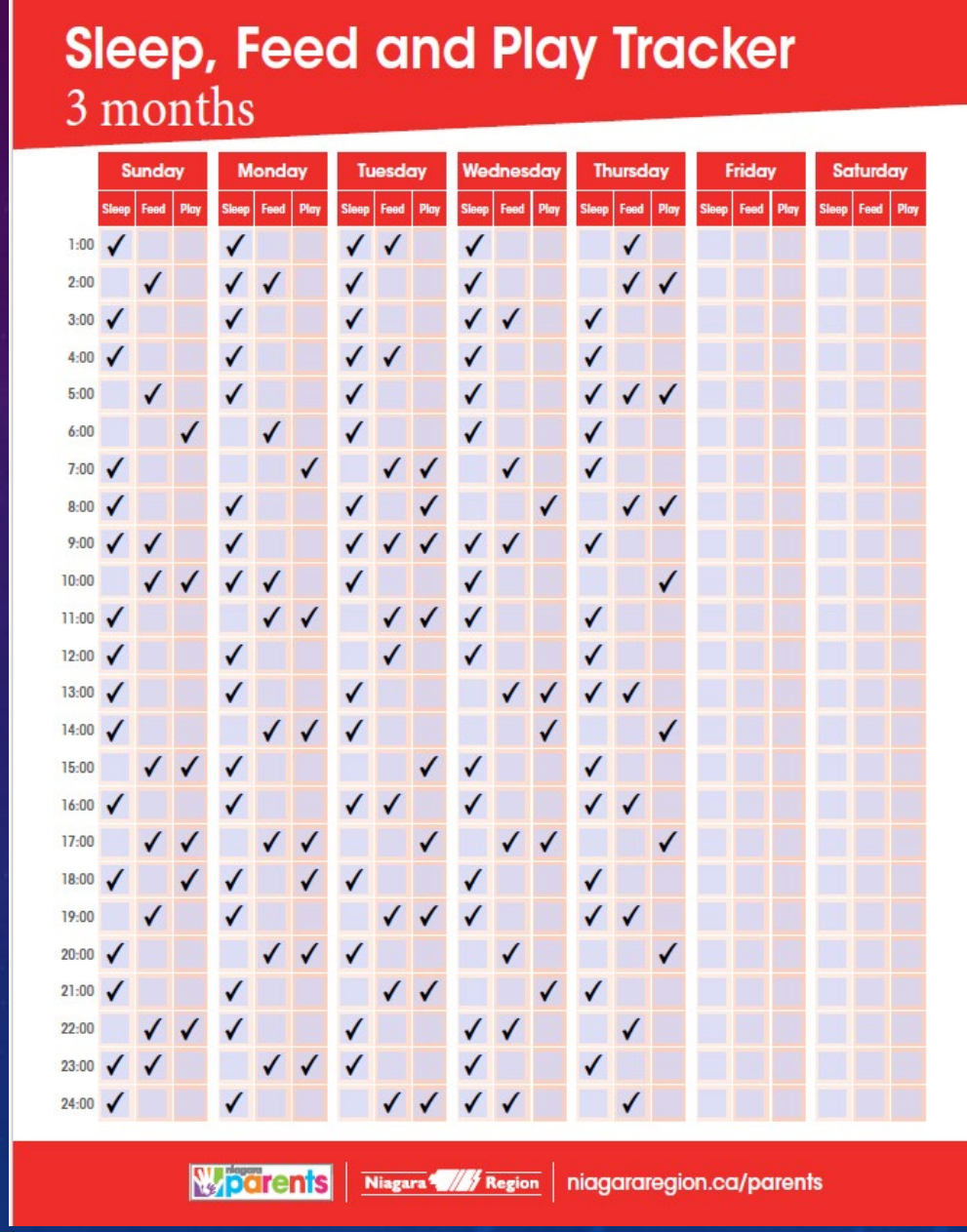
Timing: Is this timing appropriate?

Efficiency:

Alertness during the day:

Sleep behaviors:

Satisfaction and quality:



12 weeks postpartum,
(corrected age 9 weeks)

Based on the sleep, feed, and play tracker, consider some of the components of sleep health…

Duration: How many hours of sleep are they getting? Is this amount typical?

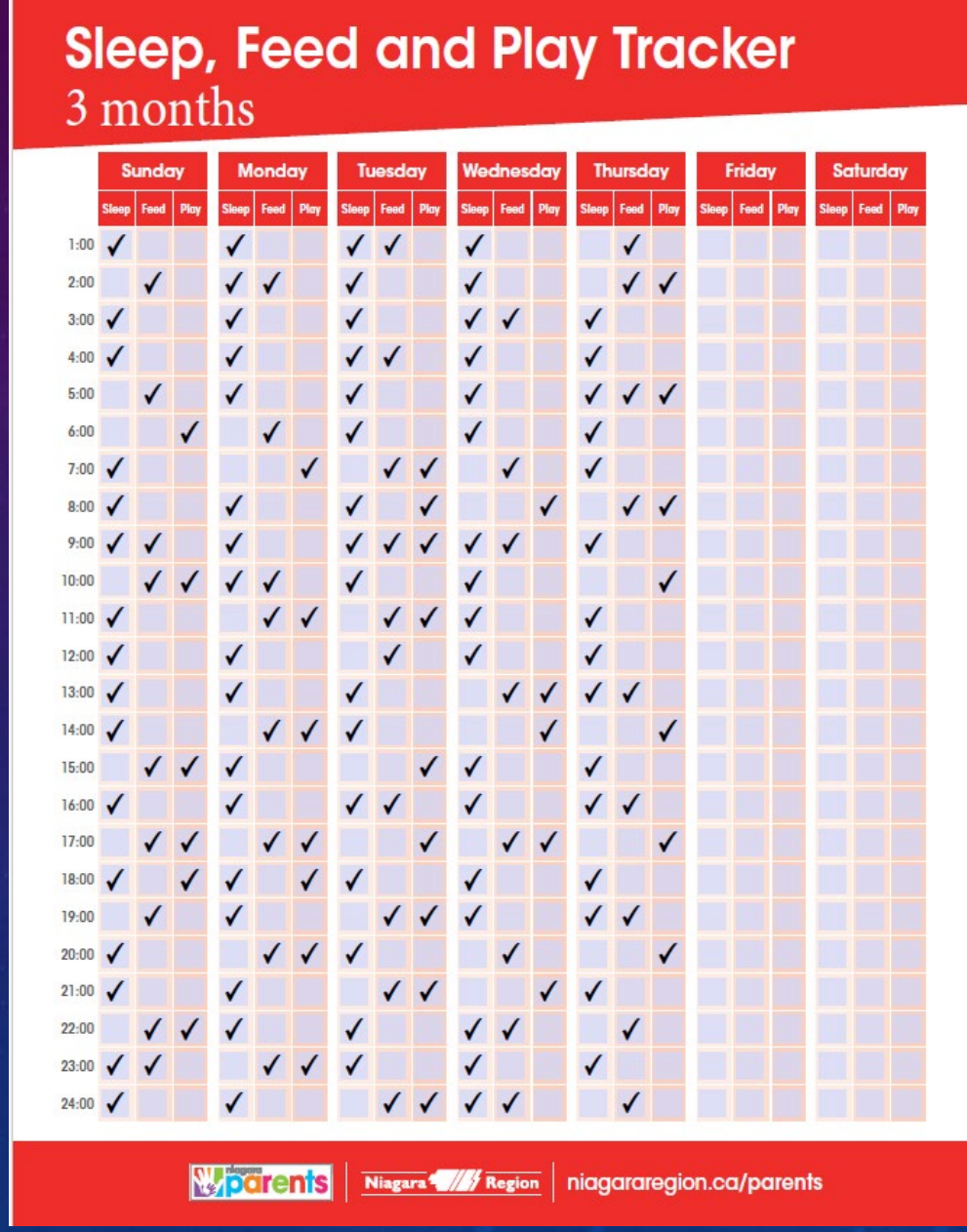
Timing: Is this timing appropriate?

Efficiency: How much time are they trying to sleep vs. actually sleeping? How long are their longest bouts of sleep?

Alertness during the day:

Sleep behaviors:

Satisfaction and quality:



12 weeks postpartum,
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Based on the sleep, feed, and play tracker, consider some of the components of sleep health…

Duration: How many hours of sleep are they getting? Is this amount typical?

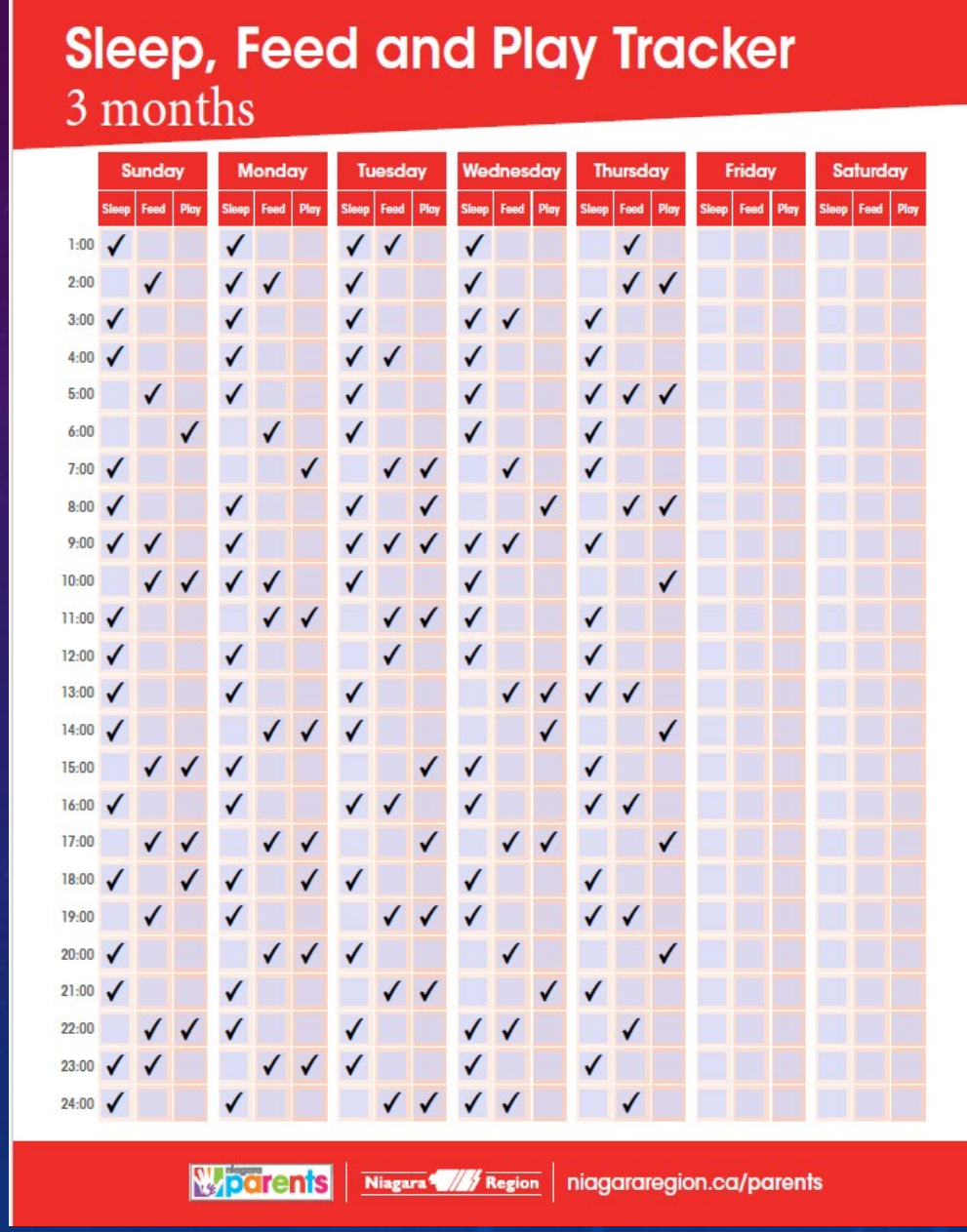
Timing: Is this timing appropriate?

Efficiency: How much time are they trying to sleep vs. actually sleeping? How long are their longest bouts of sleep?

Alertness during the day: How many naps are they having? How much daytime sleep are they getting?

Sleep behaviors:

Satisfaction and quality:



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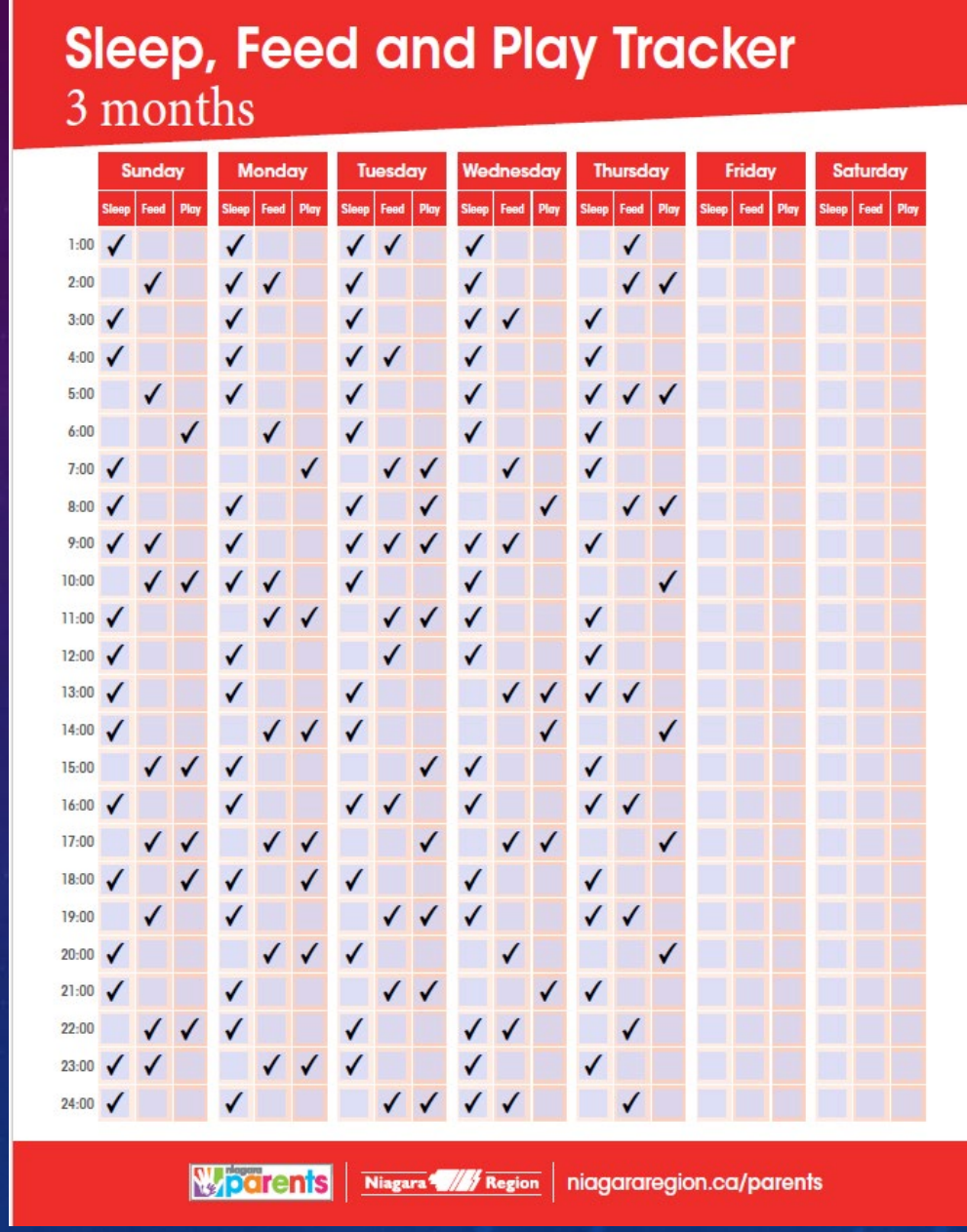
Efficiency: How much time are they trying to sleep vs. actually sleeping? How long are their longest bouts of sleep?

Alertness during the day: How many naps are they having? How much daytime sleep are they getting?

Sleep behaviors: What is happening before sleep?

Satisfaction and quality:



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Based on the sleep, feed, and play tracker, consider some of the components of sleep health…

Duration: How many hours of sleep are they getting? Is this amount typical?

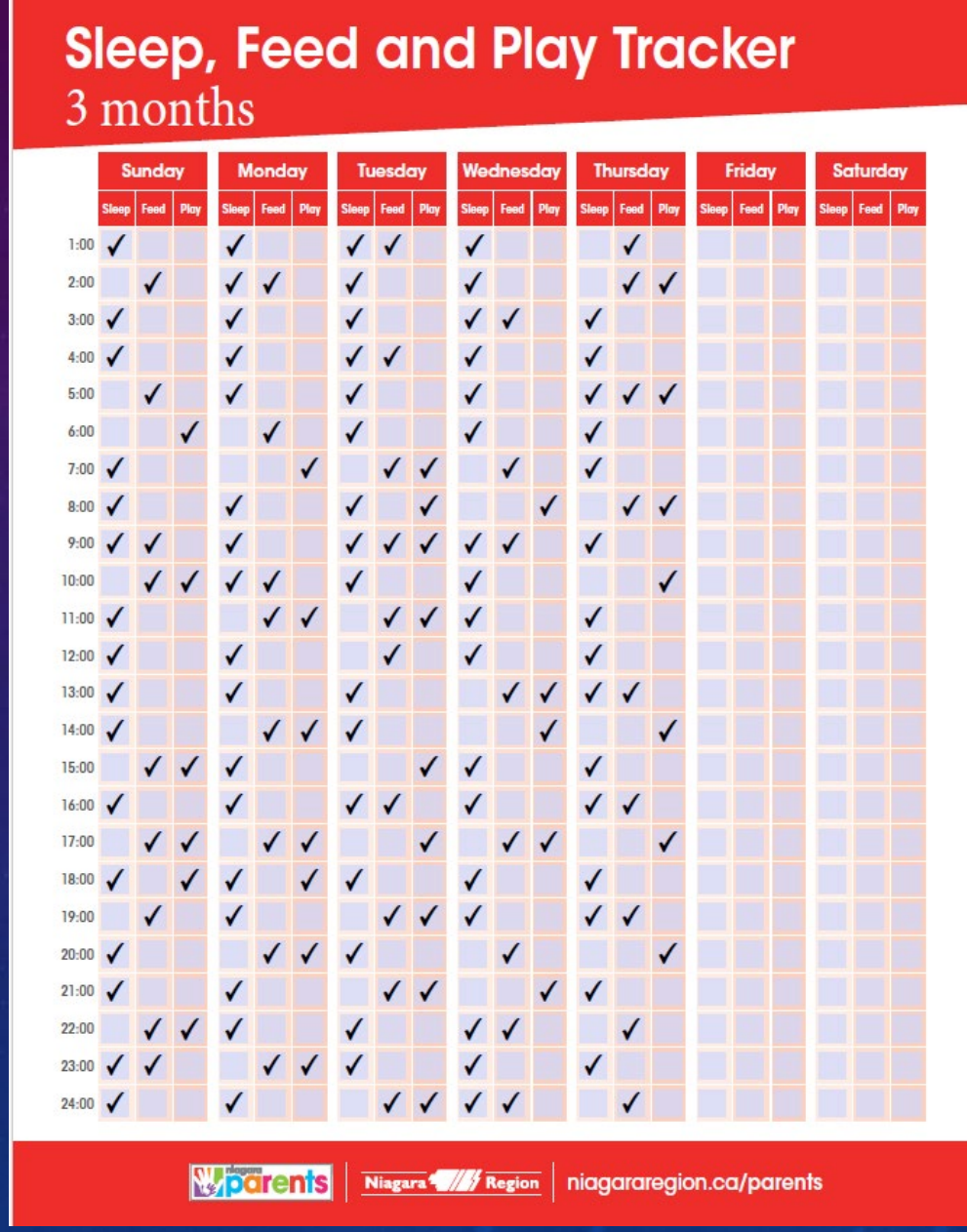
Timing: Is this timing appropriate?

Efficiency: How much time are they trying to sleep vs. actually sleeping? How long are their longest bouts of sleep?

Alertness during the day: How many naps are they having? How much daytime sleep are they getting?

Sleep behaviors: What is happening before sleep?

Satisfaction and quality: What does the family say?

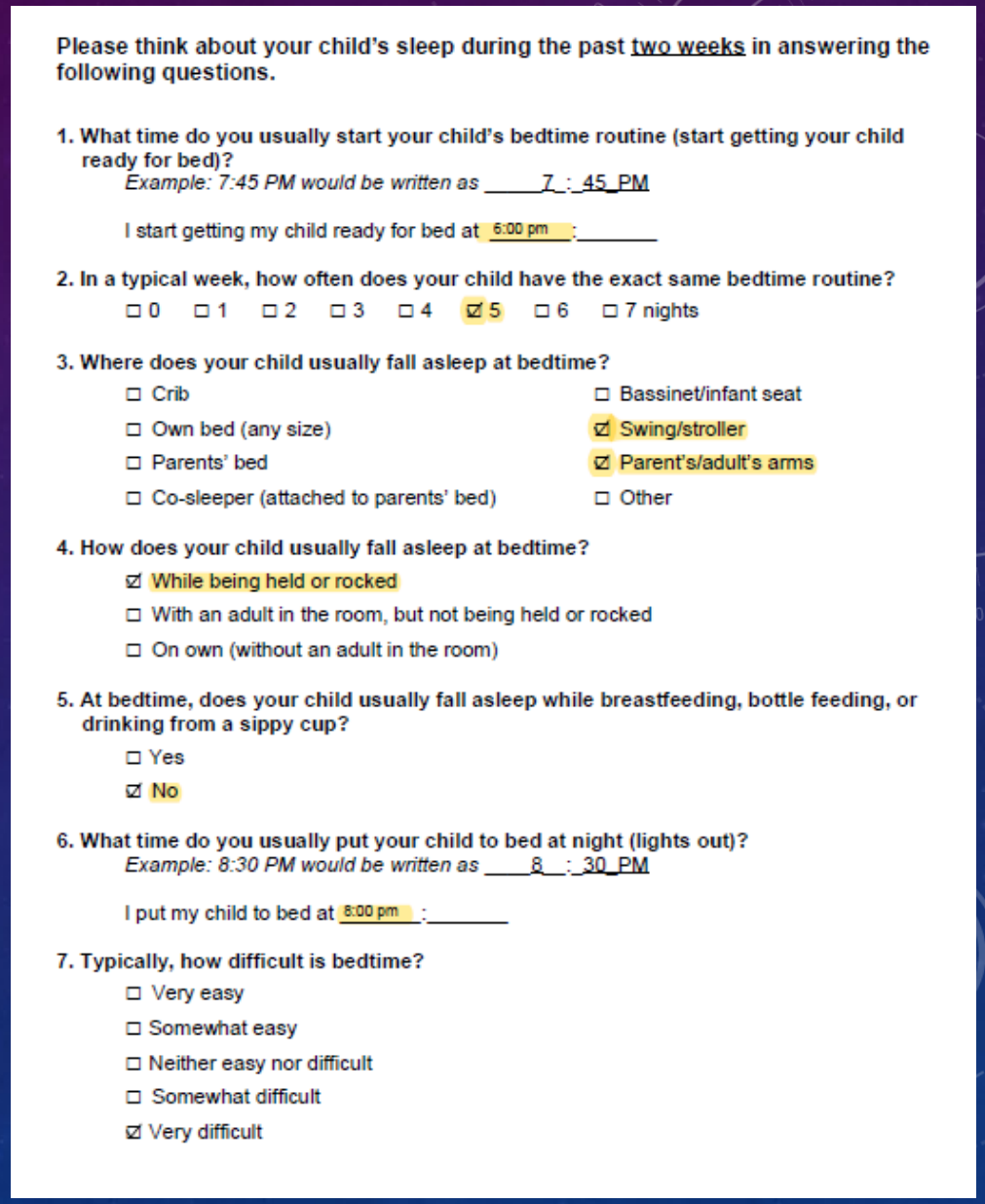


12 weeks postpartum,
(corrected age 9 weeks)

ASSESSMENT OF SLEEP QUESTIONNAIRES

Brief Infant Sleep Questionnaire – Revised (2019)

- Infant sleep patterns
- Caregiver perceptions about sleep (bedtime and sleep difficulty)
- Caregiver behaviors (sleep behaviors and locations, routines)



Please think about your child's sleep during the past two weeks in answering the following questions.

1. What time do you usually start your child's bedtime routine (start getting your child ready for bed)?
Example: 7:45 PM would be written as 7 : 45 PM

I start getting my child ready for bed at 6:00 pm :

2. In a typical week, how often does your child have the exact same bedtime routine?
☐ 0 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☑ 5 ☐ 6 ☐ 7 nights

3. Where does your child usually fall asleep at bedtime?
☐ Crib
☐ Own bed (any size)
☐ Parents' bed
☐ Co-sleeper (attached to parents' bed)
☐ Bassinet/infant seat
☑ Swing/stroller
☑ Parent's/adult's arms
☐ Other

4. How does your child usually fall asleep at bedtime?
☑ While being held or rocked
☐ With an adult in the room, but not being held or rocked
☐ On own (without an adult in the room)

5. At bedtime, does your child usually fall asleep while breastfeeding, bottle feeding, or drinking from a sippy cup?
☐ Yes
☑ No

6. What time do you usually put your child to bed at night (lights out)?
Example: 8:30 PM would be written as 8 : 30 PM

I put my child to bed at 8:00 pm :

7. Typically, how difficult is bedtime?
☐ Very easy
☐ Somewhat easy
☐ Neither easy nor difficult
☐ Somewhat difficult
☑ Very difficult

Mindell JA, Gould RA, Tikotzky L, Leichman ES, & Walters RM. (2019). Norm-referenced scoring system for the Brief Infant Sleep Questionnaire – Revised (BISQ-R). *Sleep Medicine, 63,* 106 – 114.

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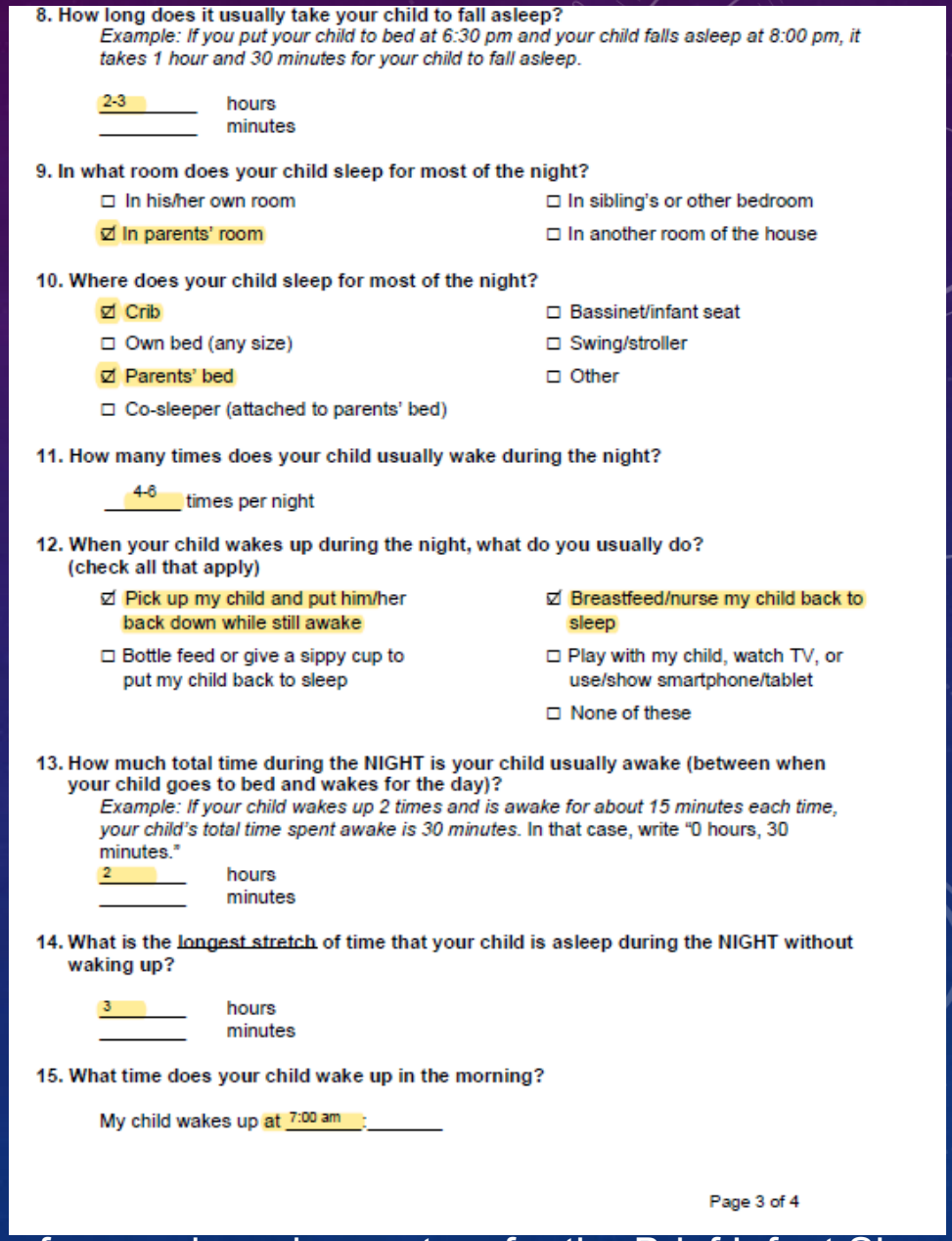


8. How long does it usually take your child to fall asleep?
Example: If you put your child to bed at 6:30 pm and your child falls asleep at 8:00 pm, it takes 1 hour and 30 minutes for your child to fall asleep.

2-3 hours
_____ minutes

9. In what room does your child sleep for most of the night?

- ☐ In his/her own room
- ☐ In sibling's or other bedroom
- ☑ In parents' room
- ☐ In another room of the house

10. Where does your child sleep for most of the night?

- ☑ Crib
- ☐ Bassinet/infant seat
- ☐ Own bed (any size)
- ☐ Swing/stroller
- ☑ Parents' bed
- ☐ Other
- ☐ Co-sleeper (attached to parents' bed)

11. How many times does your child usually wake during the night?

4-6 times per night

12. When your child wakes up during the night, what do you usually do? (check all that apply)

- ☑ Pick up my child and put him/her back down while still awake
- ☑ Breastfeed/nurse my child back to sleep
- ☐ Bottle feed or give a sippy cup to put my child back to sleep
- ☐ Play with my child, watch TV, or use/show smartphone/tablet
- ☐ None of these

13. How much total time during the NIGHT is your child usually awake (between when your child goes to bed and wakes for the day)?
Example: If your child wakes up 2 times and is awake for about 15 minutes each time, your child's total time spent awake is 30 minutes. In that case, write "0 hours, 30 minutes."

2 hours
_____ minutes

14. What is the longest stretch of time that your child is asleep during the NIGHT without waking up?

3 hours
_____ minutes

15. What time does your child wake up in the morning?

My child wakes up at 7:00 am :_____

Page 3 of 4

Mindell JA, Gould RA, Tikotzky L, Leichman ES, & Walters RM. (2019). Norm-referenced scoring system for the Brief Infant Sleep Questionnaire – Revised (BISQ-R). *Sleep Medicine, 63,* 106 – 114.

SUPPORTING FAMILIES TO MANAGE INFANT SLEEP

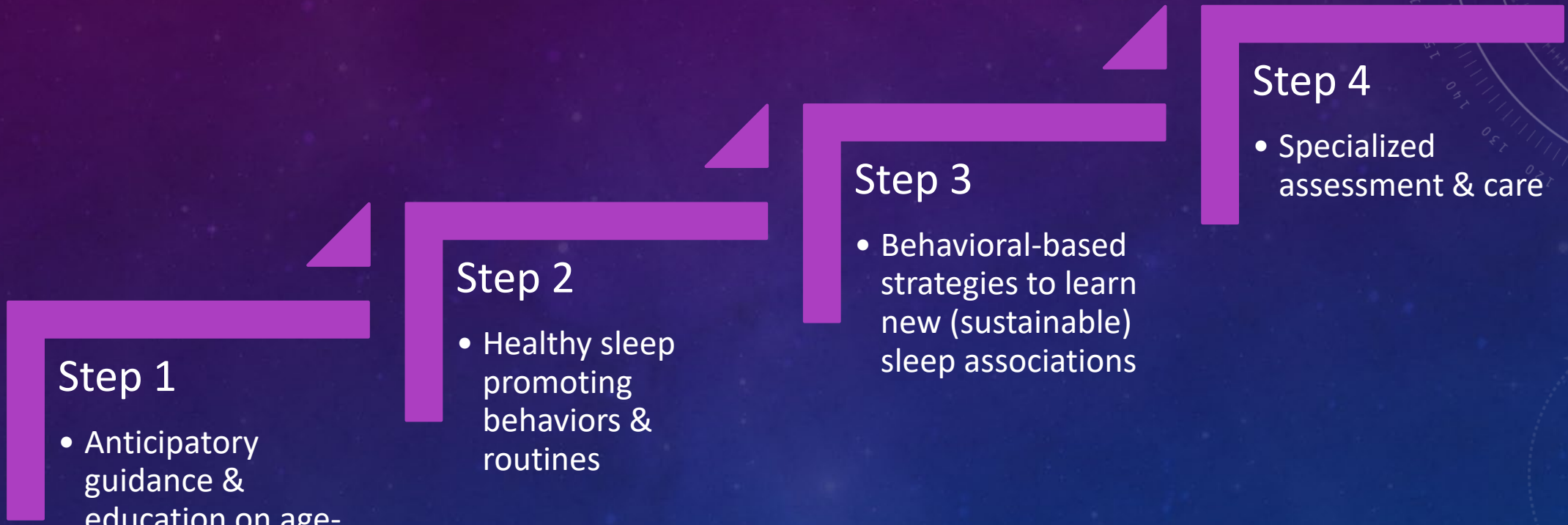
SUPPORTING FAMILIES TO MANAGE INFANT SLEEP

- Prevention “vs.” treatment of problems
  - Results from prevention interventions are mixed (Galland et al., 2017; Hiscock et al., 2014; Stremler et al., 2013; Stremler et al., 2006)
  - Learning sleep habits is a work in progress

- Engaging families in a family-centred approach
  - Understanding sleep beliefs, other parental concerns, and goals for sleep
  - The “best” strategy is the one that fits and families can use consistently

- Situating sleep concerns within the broader family context
  - Can help prioritize different concerns and approaches

SUPPORTING FAMILIES TO MANAGE INFANT SLEEP STEPPED APPROACH



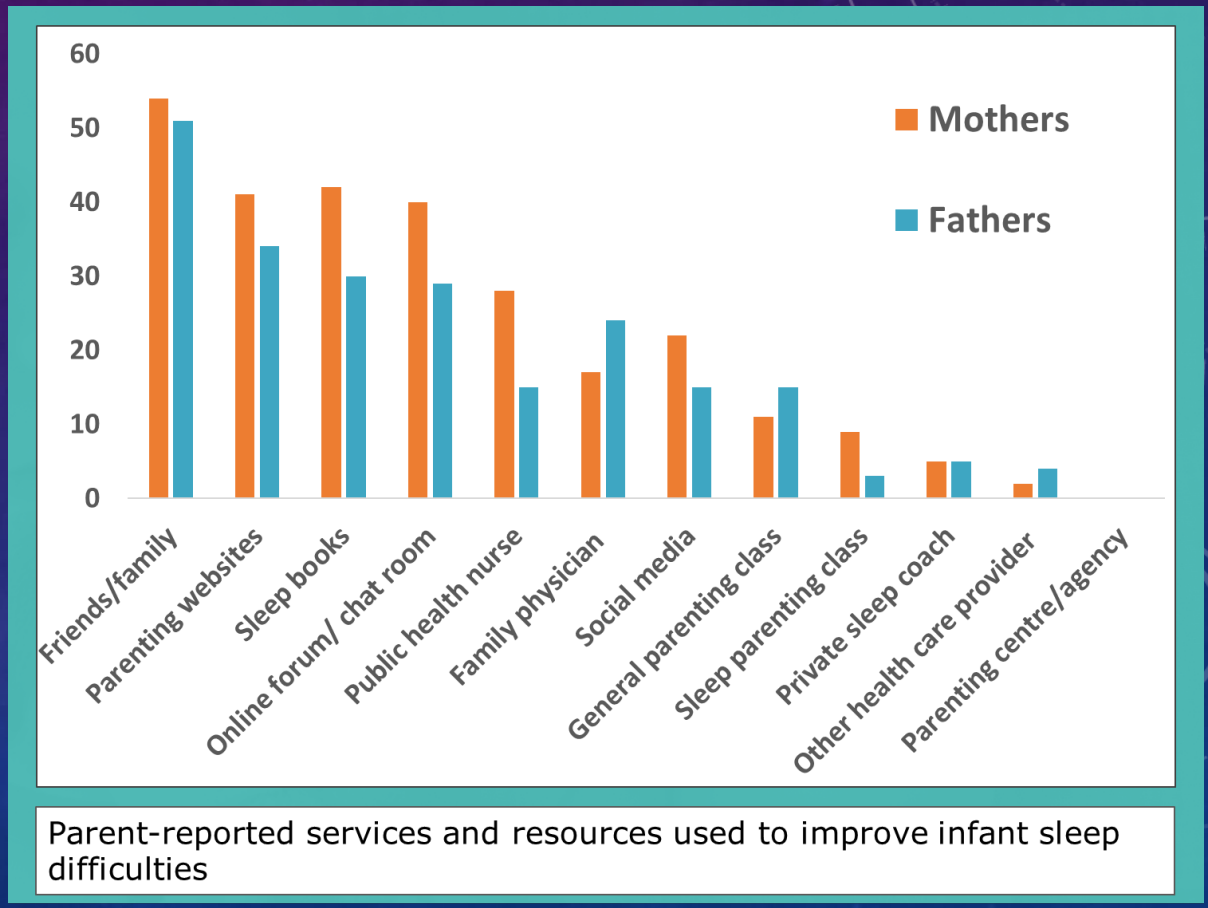
Espie C. A. (2009). "Stepped care": a health technology solution for delivering cognitive behavioral therapy as a first line insomnia treatment. *Sleep*, *32*(12), 1549–1558. https://doi.org/10.1093/sleep/32.12.1549

Zhou, E. S., & Owens, J. (2016). Behavioral treatments for pediatric insomnia. Current Sleep Medicine Reports, 2, 127-135.

Boerner, K. E., Coulombe, J. A., & Corkum, P. (2015). Core competencies for health professionals' training in pediatric behavioral sleep care: a Delphi study. Behavioral sleep medicine, 13(4), 265-284.

STEP 1: ANTICIPATORY GUIDANCE ON AGE-APPROPRIATE SLEEP BEHAVIORS

- Education about developmentally appropriate sleep patterns
  - Can integrate information from sleep assessments
  - Many parents already accessing information and experiencing “information overwhelm” (Keys et al., 2022)
- Activate positive social supports
  - Engagement of parenting partners or other social supports and “father involvement” (Keys et al., 2022).



Parent-reported services and resources used to improve infant sleep difficulties

STEP 2: HEALTHY SLEEP PROMOTING BEHAVIORS & ROUTINES

Routines

- Daytime routines
- Implementing consistent pre-sleep routines can improve sleep (Mindell et al. 2009, 2015, 2017)
  - External physical cues for sleep

"Yeah, I think it's just a Catch 22 cuz you wanna get better sleep, but you're so sleep deprived that you can't see like the, the long-term results. Like you wanna see it right away but it really does take like a lot of patience."

STEP 2: HEALTHY SLEEP PROMOTING BEHAVIORS & ROUTINES

Routines

- Daytime routines
- Implementing consistent pre-sleep routines can improve sleep (Mindell et al. 2009, 2015, 2017)
  - External physical cues for sleep

ABCs of SLEEPING

Age-appropriate
Bedtimes with
Consistency,

Schedules & routines,
Location,
Exercise & Diet,
no **E**lectronics,
Positivity,
Independence when falling asleep,
Needs of child met
= **G**reat Sleep

Allen, S. L., Howlett, M. D., Coulombe, J. A., & Corkum, P. V. (2016). ABCs of SLEEPING: A review of the evidence behind pediatric sleep practice recommendations. Sleep medicine reviews, 29, 1–14. https://doi.org/10.1016/j.smrv.2015.08.006

STEP 2: HEALTHY SLEEP PROMOTING BEHAVIORS & ROUTINES

Cue-based care to build routines

- Cue-based care
  - Parent-child interactions may be disrupted by sleep difficulties (Keys, et al, 2022)

St James-Roberts, I., Roberts, M., Hovish, K., & Owen, C. (2015). Video Evidence That London Infants Can Resettle Themselves Back to Sleep After Waking in the Night, as well as Sleep for Long Periods, by 3 Months of Age. Journal of developmental and behavioral pediatrics : JDBP, 36(5), 324–329. https://doi.org/10.1097/DBP.0000000000000166

EARLY SLEEP CUES

What are some early (subtle) disengagement cues that may signal the need for sleep?

1. Rubbing eyes
2. Hands to face/head
3. Yawning
4. Glazed look in the eyes
5. Fussing or grunting
6. Rapid blinking
7. Red eyes

EARLY SLEEP CUES

What are some early (subtle) disengagement cues that may signal the need for sleep?

1. **Rubbing eyes**
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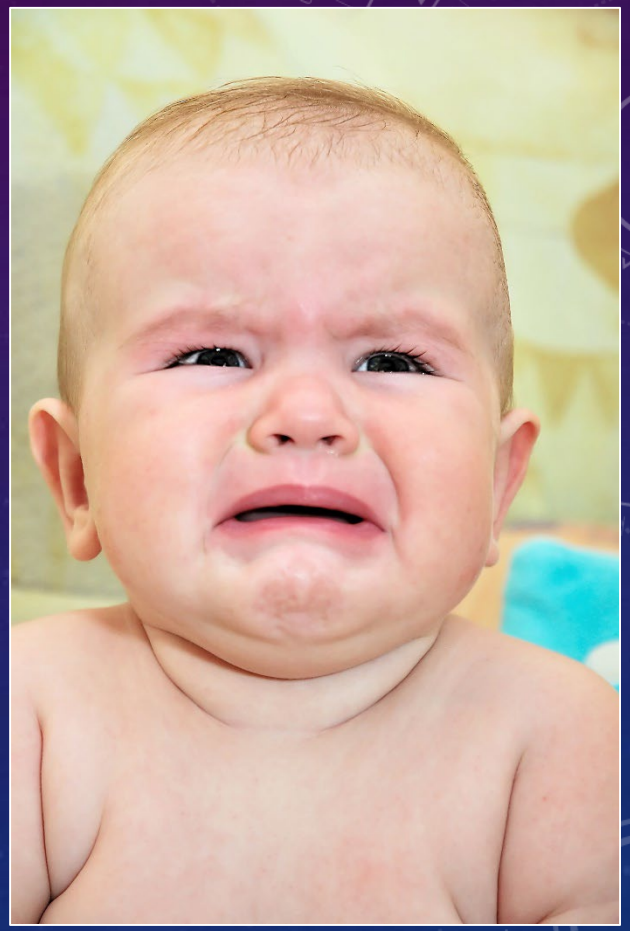
3. **Yawning**
4. **Glazed look in the eyes**
5. **Fussing or grunting**
6. **Rapid blinking**
7. **Red eyes**

LATER SLEEP / OVERTIRED CUES

- Irritable and easily frustrated
- Crying
- Wide awake again—second wind!
- Hard to settle / Trouble sleeping
- Arching back



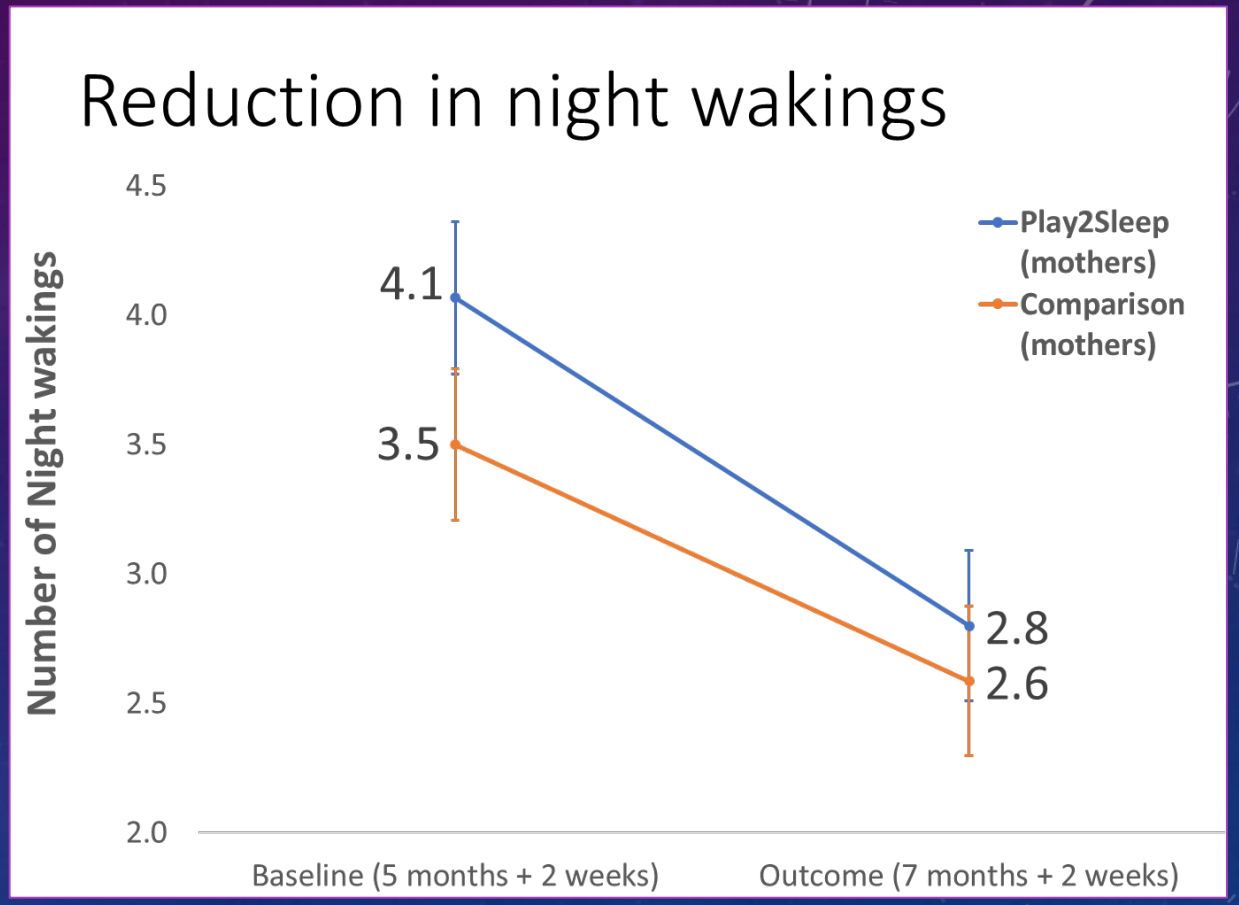
Younger infants may need more assistance to down-regulate if they reach the overtired state

STEP 2: HEALTHY SLEEP PROMOTING BEHAVIORS & ROUTINES

Cue-based care to build routines

Cue-based care

- Parent-child interactions may be disrupted by sleep difficulties (Keys, et al, 2022)



Keys et al., 2022

STEP 2: HEALTHY SLEEP PROMOTING BEHAVIORS & ROUTINES

Cue-based care to build routines

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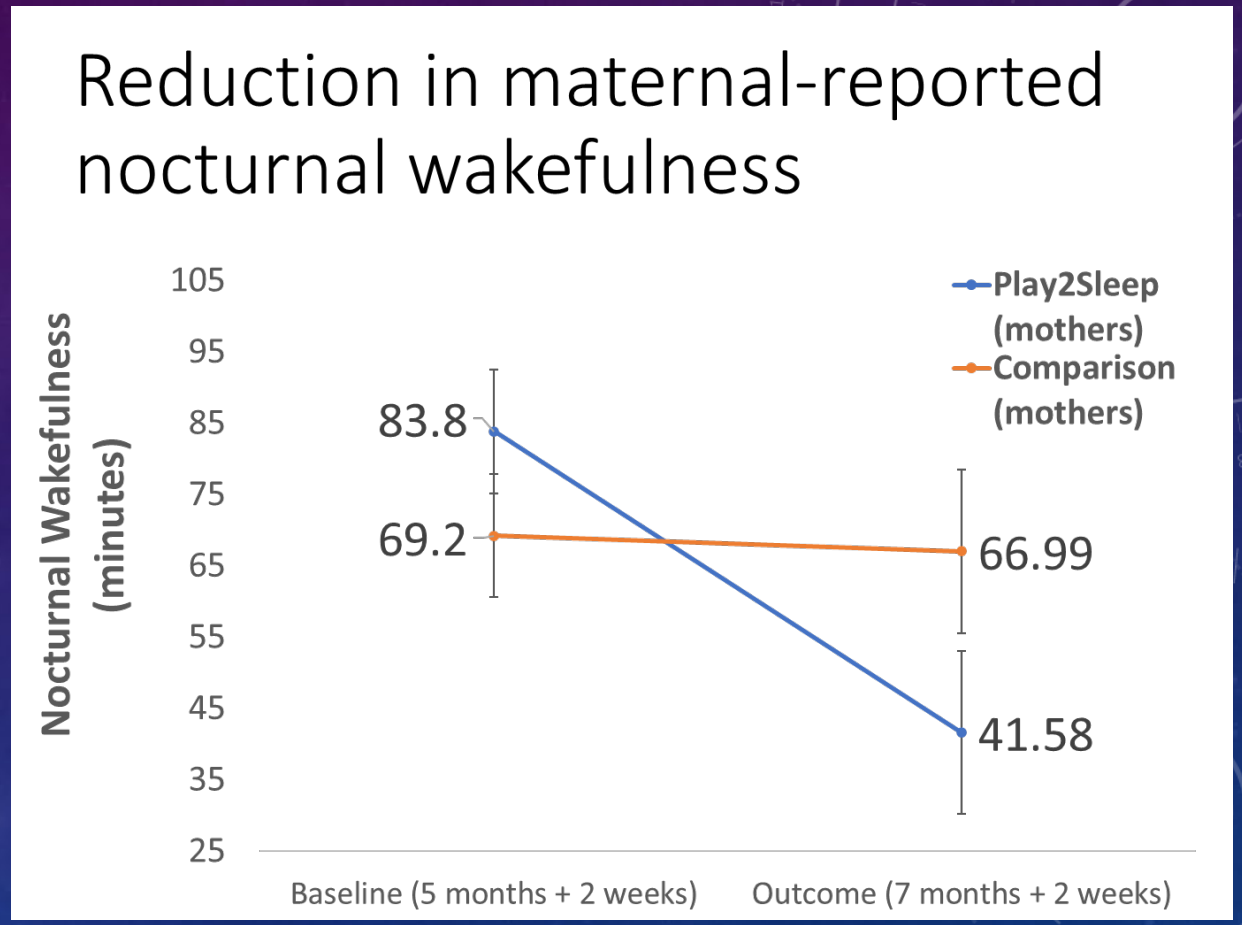


Keys et al., 2022

STEP 3: BEHAVIORAL-BASED STRATEGIES TO LEARN NEW (SUSTAINABLE) SLEEP ASSOCIATIONS

- Range from more direct (i.e., graduated extinction) to more gradual (i.e., camping out)
- Bedtime fading is where the bedtime is pushed back to coincide closer to the actual time of falling asleep
- Purpose is to modify sleep associations

STEP 3: BEHAVIORAL-BASED STRATEGIES TO LEARN NEW (SUSTAINABLE) SLEEP ASSOCIATIONS

- Range from more direct (i.e., graduated extinction) to more gradual (i.e., camping out)

- Bedtime fading is where the bedtime is pushed back to coincide closer to the actual time of falling asleep

- Purpose is to modify sleep associations
  - What sleep associations are going to be sustainable for families?
  - Can introduce new ones before removing unsustainable ones
  - Takes repetition to learn new habits

STEP 3: BEHAVIORAL-BASED STRATEGIES TO LEARN NEW (SUSTAINABLE) SLEEP ASSOCIATIONS

- Behavioral strategies are effective in reducing parent-reported wakings with no evidence of long-term negative effects (Hall et al., 2015; Price et al., 2012)
- Concerns about implementing extinction-based strategies in infants < 6 months of age
  - Negatively impact feeding & maternal-child health (Douglas & Hill, 2013
- Parents may implement these strategies with no supports before 6 months with mixed success (Honaker et al., 2018; Loutzenhiser, et al., 2014)
  - Parental concerns about process can lead to inconsistencies (Tse & Hall, 2008)

STEP 3: BEHAVIORAL-BASED STRATEGIES TO LEARN NEW (SUSTAINABLE) SLEEP ASSOCIATIONS

- Work with families to develop plan (and contingency plans) based on family priorities and broader family context
- The approach that families can consistently use is likely the "best" one
  - "working together" as a parenting couple (Keys et al., 2022)

STEP 3: BEHAVIORAL-BASED STRATEGIES TO LEARN NEW (SUSTAINABLE) SLEEP ASSOCIATIONS

- Work with families to develop plan (and contingency plans) based on family priorities and broader family context
- The approach that families can consistently use is likely the "best" one
  - "working together" as a parenting couple (Keys et al., 2022)

OARS Model may be helpful in working with parents to develop a plan that fits

- **O**pen-ended questioning
- **A**ffirmation
- **R**eflective Listening
- **S**ummarizing

(https://phnprep.ca/resources/oars-model/)

STEP 4: CONSIDER NEED FOR SPECIALIZED CARE AND/OR FURTHER ASSESSMENT

- 19% of infants may experience persistent and severe infant sleep problems (Cook et al., 2020)
- Persistent and severe sleep problems are ~ 2.7X increased in problematic emotional symptoms at 4 and 10 years (Cook et al., 2020)
- Multiple regulatory difficulties associated with ~2.8x chance of clinically significant mental health difficulties at 5 & 11 yrs (Cook et al, 2019)

STEP 4: CONSIDER NEED FOR SPECIALIZED CARE AND/OR FURTHER ASSESSMENT

- May be underlying issues that need further investigation:
  - sleep-related breathing issues (snoring/gasping)
  - weight / feeding difficulties
  - significant mental health issues

- Additional assessment and/or support from family physician/NP, pediatrician, clinical psychologist, sleep specialist

Map of Canadian pediatric sleep clinics and laboratories

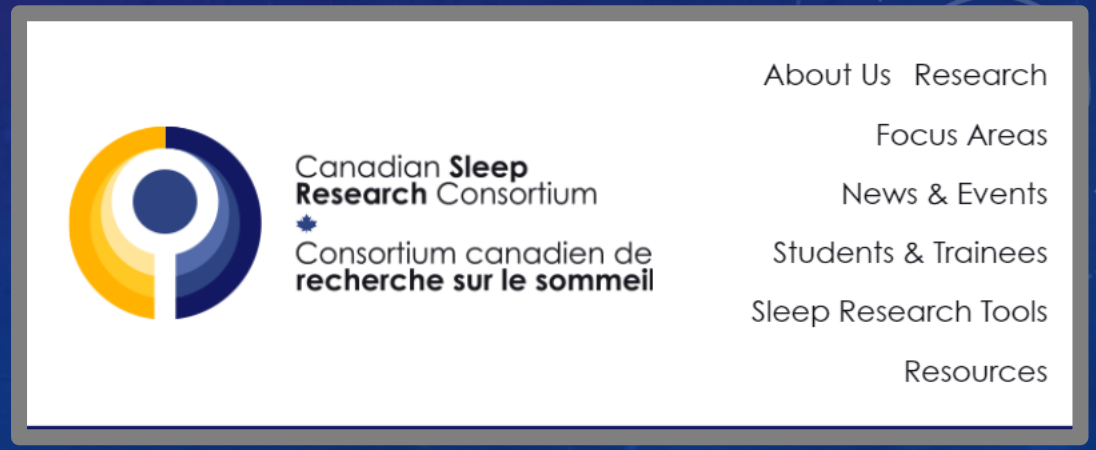
ADDITIONAL LEARNING & RESOURCES

ADDITIONAL LEARNING & RESOURCES

- PHN PREP Resource

- Canadian Sleep Research Consortium
  - Indigenous Sleep Knowledge (Dr. Amy Shawanda)
  - Navigating parenting experiences of sleep during early childhood (Dr. Elizabeth Keys)

www.researchsleep.ca/workshops-webinars



ADDITIONAL LEARNING & RESOURCES

Current Canadian Sleep Research

SLeep solUtions to proMote Better Early childhood Relationships (SLUMBER) Research Lab, UBC Okanagan (https://blogs.ubc.ca/slumber/)

- The SLUMBER Project
- Early Childhood Hub for the Sleep Across the Lifespan Team Grant (Dr. P. Corkum, https://betternightsbetterdays.ca/)
  - Promoting Healthy Sleep Training Program for HCPs
- Community Engagement Pillar, Sleep Health Equity Grant (Dr. L. Tomfohr-Madsen)
  - Priority setting partnership on sleep health equity research priorities

ADDITIONAL LEARNING & RESOURCES

Professional societies

- International
  - International Pediatric Sleep Society (www.pedsleep.org)
  - Pediatric Sleep Council (www.babysleep.com)
- National
  - Canadian Sleep Society (https://css-scs.ca/)
  - Sleep on It! https://sleeponitcanada.ca/

Books

- Cappuccio, F., Miller, M. A., & Lockley, S. W. (2018). *Sleep, health, and society: From aetiology to public health* (Second ed.). Oxford University Press. https://doi.org/10.1093/oso/9780198778240.001.0001
- Parent-child relationship programs. *Beginning Rhythms: The Emerging Process of Sleep/Wake Behavior and Self-Regulation* (Second ed.)

"You shouldn’t sleep train at all, before a year, before 6 months, or before 4 months, but if you wait too late, your baby will never be able to sleep without you. College-aged children never need to be nursed, rocked, helped to sleep, so don’t worry about any bad habits. Nursing, rocking, singing, swaddling, etc to sleep are all bad habits and should be stopped immediately.

Naps should only be taken in the bed, never in a swing, car seat, stroller, or when worn. Letting them sleep in the car seat or swing will damage their skulls. If your baby has trouble falling asleep in the bed, put them in a swing, car seat, stroller, or wear them. Use the crib only for sleep and keep it free of distractions. If the baby is having trouble adjusting to the crib, have them play in it first. If the baby wakes up at night and wants to play, put fun toys in the crib to distract them.

Put the baby in a nursery, bed in your room, in your bed. Co-sleeping is the best way to get sleep, except that it can kill your baby, so never, ever do it. If your baby doesn't die, you will need to bed-share until college.

Keep the room warm, but not too warm. Swaddle the baby tightly, but not too tightly. Put them on their backs to sleep, but don't let them be on their backs too long or they will be developmentally delayed. Give them a pacifier to reduce SIDS. Be careful about pacifiers because they can cause nursing problems and stop your baby from sleeping soundly. If your baby sleeps too soundly, they’ll die of SIDS.

http://www.today.com/news/exhausted-new-moms-hilarious-take-expert-sleep-advice-goes-viral-6C9559908

Don’t let your baby sleep too long, except when they’ve been napping too much, then you should wake them. Never wake a sleeping baby. Any baby problem can be solved by putting them to bed earlier, even if they are waking up too early. If your baby wakes up too early, put them to bed later or cut out a nap. Don’t let them nap after 5 p.m.

Sleep begets sleep, so try to get your child to sleep as much as possible. Put the baby to bed awake but drowsy. Don't wake the baby if it fell asleep while nursing.

You should start a routine and keep track of everything. Don’t watch the clock. Put them on a schedule. Scheduling will make your life impossible because they will constantly be thrown off of it and you will become a prisoner in your home.

Using the "Cry It Out" method (CIO) will make them think they’ve been abandoned and will be eaten by a lion shortly. It also causes brain damage. Not getting enough sleep will cause behavior and mental problems, so be sure to put them to sleep by any means necessary, especially CIO, which is the most effective form. CIO is cruel beyond belief and the only thing that truly works because parents are a distraction.

Formula and solid foods will help the baby sleep longer. Solid foods shouldn’t be given at night because they might wake the baby. Don't stop the baby from nursing when asleep. Be wary of night feeds. If you respond too quickly with food or comfort, your baby is manipulating you. Babies can’t manipulate. Babies older than six months can manipulate.

Sleep when the baby sleeps. Clean when the baby cleans. Don’t worry. Stress causes your baby stress and a stressed baby won't sleep."

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QUESTIONS AND CONTACT

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(1) Becoming a research advisor or ambassador
(2) Signing up for the newsletter