Infant sleep and feeding – the key is in the clock

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Outline

- Background
- Physiology
- Application
- Conclusion

Conflict of Interest Disclosures for Speakers

☒ 1. I do not have any potential conflicts to disclose.

☐ 2. I wish to disclose the following potential conflicts of interest:

Type of Potential Conflict	Details of Potential Conflict
Grant/Research Support	N/A
Consultant	N/A
Speakers' Bureaus	N/A
Financial support	N/A
Other	N/A

☐ 3. The material presented in this lecture has no relationship with any of these potential conflicts, **OR**

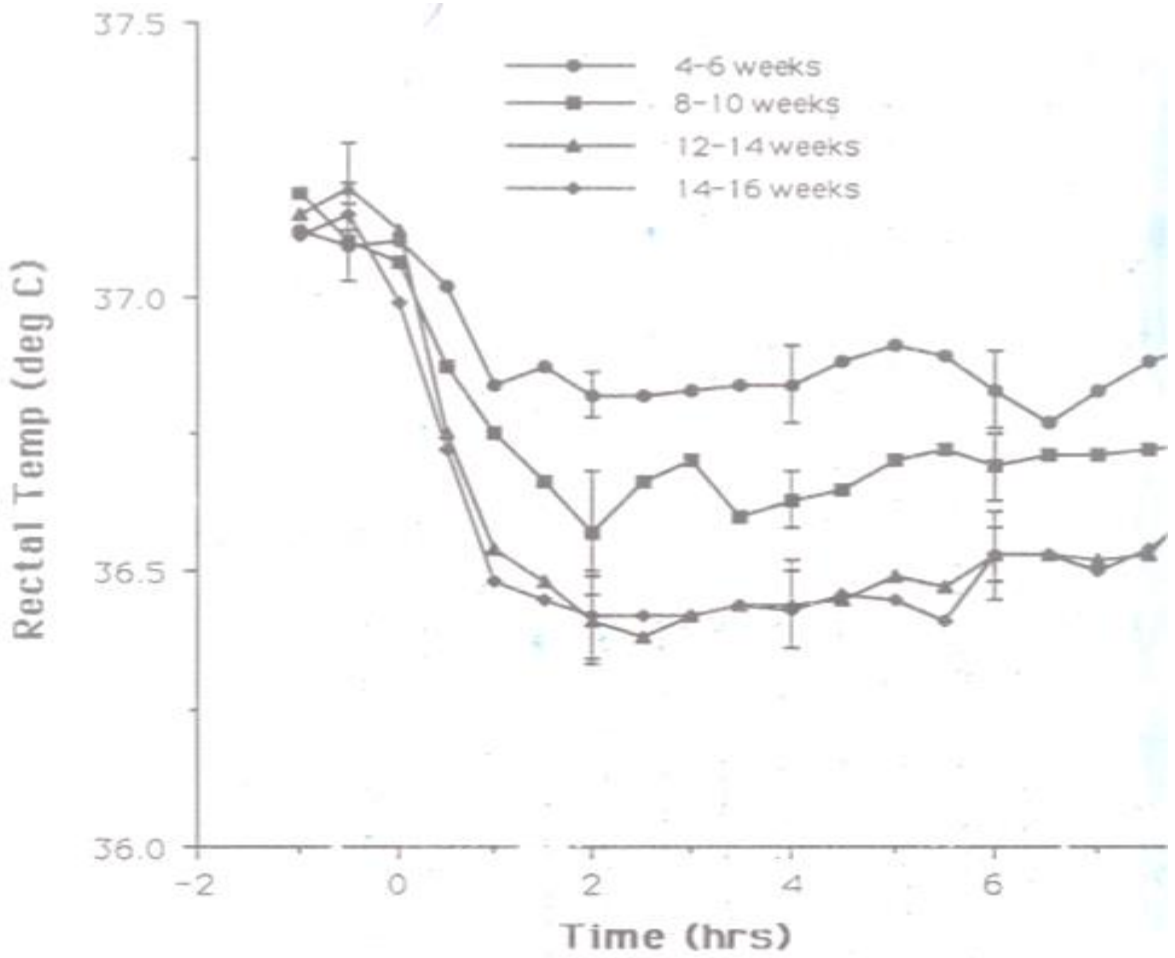
☐ 4. This talk presents material that is related to one or more of these potential conflicts, and the following objective references are provided as support for this lecture:

Introduction

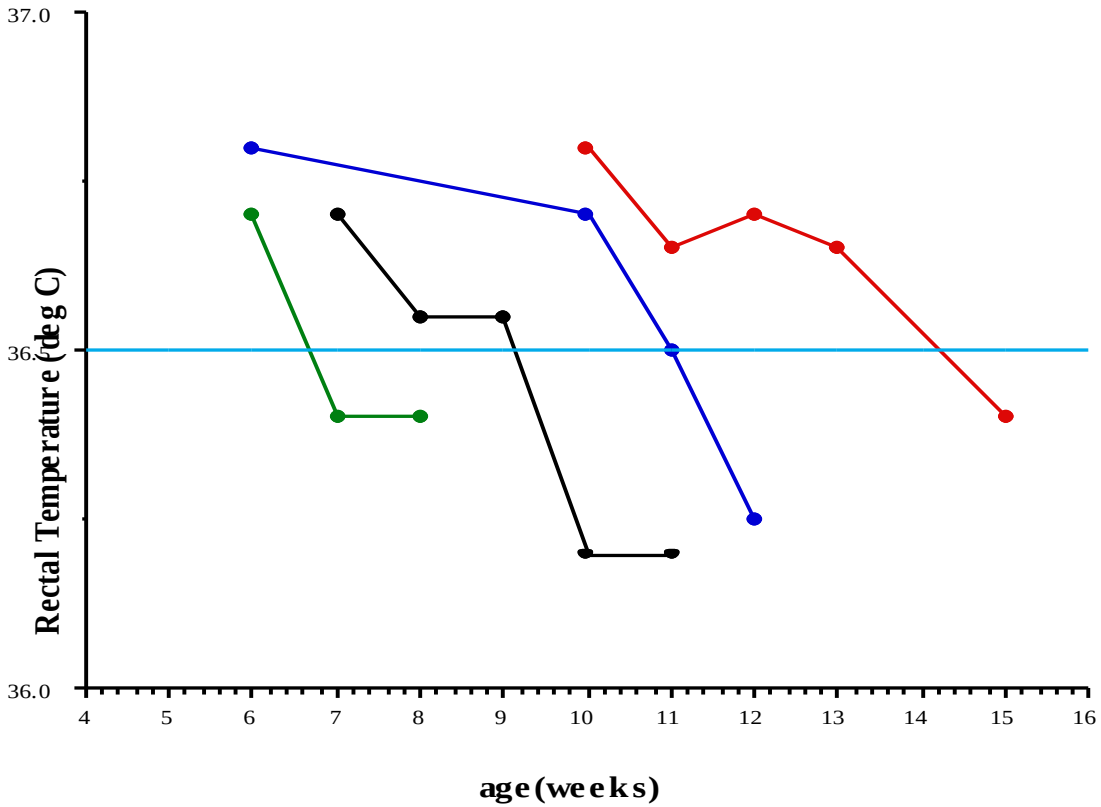
- Circadian rhythms not present at birth
- Foetal bio rhythms determined by maternal rhythms
- Delivery - physical separation
- Close relationship between mother and infant

Introduction

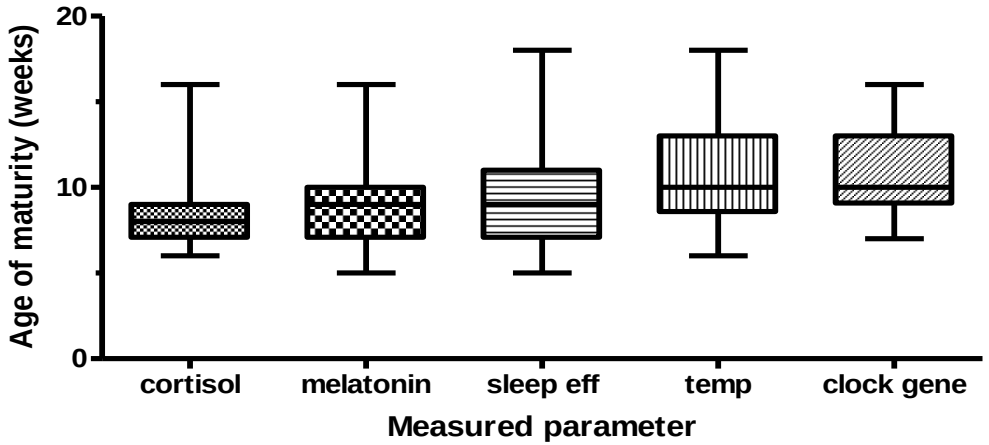
- Infant rhythms achieved at different rates
- Rate of maturity – used as marker of development
- Different factors affect rate of maturation
- Critical window 3-6 months


4-6 weeks
8-10 weeks
12-14 weeks
14-16 weeks
Rectal Temp (deg C)
37.5
37.0
36.5
36.0
-2
0
2
4
6
Time (hrs)

Development of maximum fall in overnight core temperature with age for four infants



Ontogeny of circadian rhythms in newborns



Circadian rhythm development

- What controls the rate of development of the body systems?
- Do any environmental factors affect these?

Factors affecting circadian rhythm development

At Risk

- IUGR
- Prematurity
- Male
- Smoking household
- Bottle fed
- Social deprivation
- Lone sleeping

Sleep and feeding type

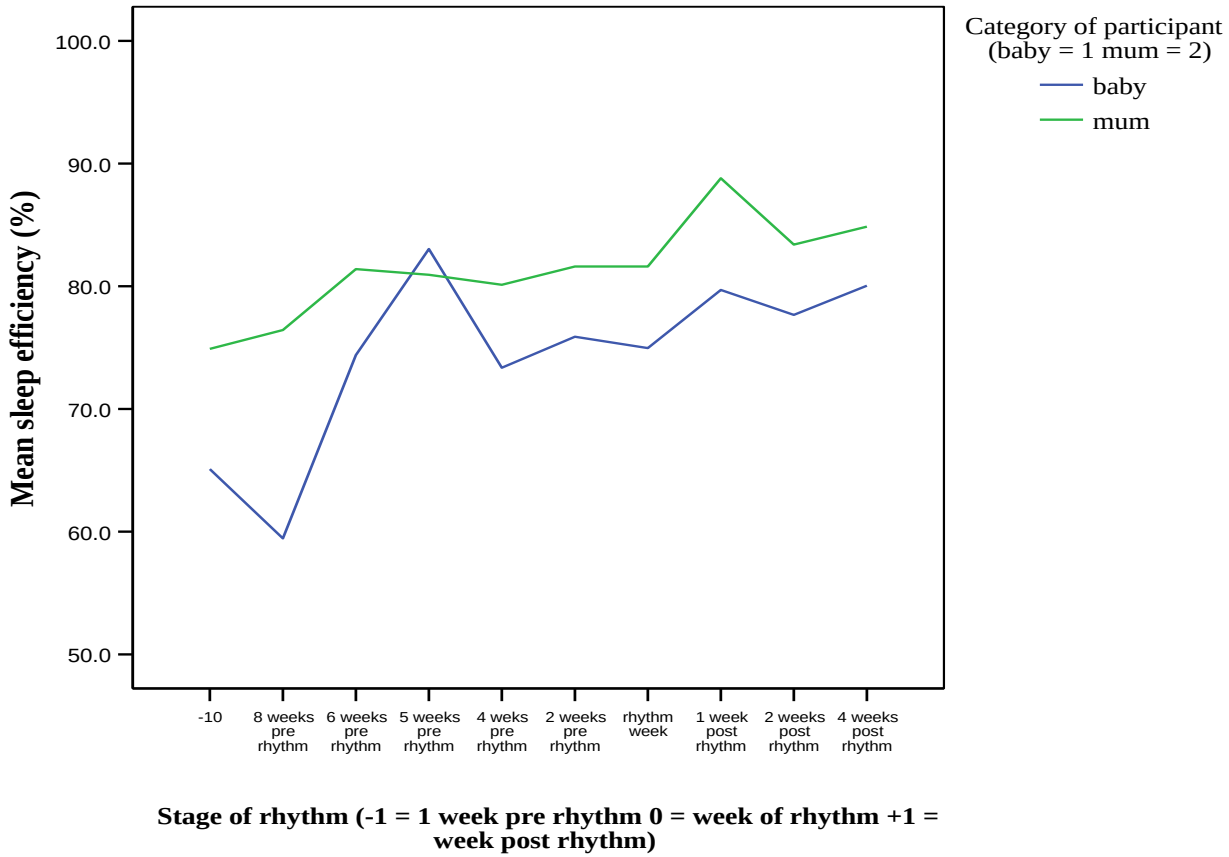
- Relationship between sleep and feeding complex
- Feeding clock input & clock output
- Type feeding has influence
- Breast fed infants – wake more often
- Infant physiology however more advanced (breast fed)

Sleep and feeding

- Breast feeding
- Proximity of infant-maternal dyad
- Continuum
- Antenatal – postnatal relationship

Sleep and proximity

Comparison of average sleep efficiency between 35 infants and their mothers over 13 week study period plotted against developmental age of infants



Sleep and proximity

	Dependent variable: Infant sleep efficiency (%)		
Covariate	β/coefficient	P value	95% CI*
Age rhythm achieved	-1.57	0.004	-2.618 to -0.529
Room where baby slept	-9.00	0.015	-16.00 to -1.80

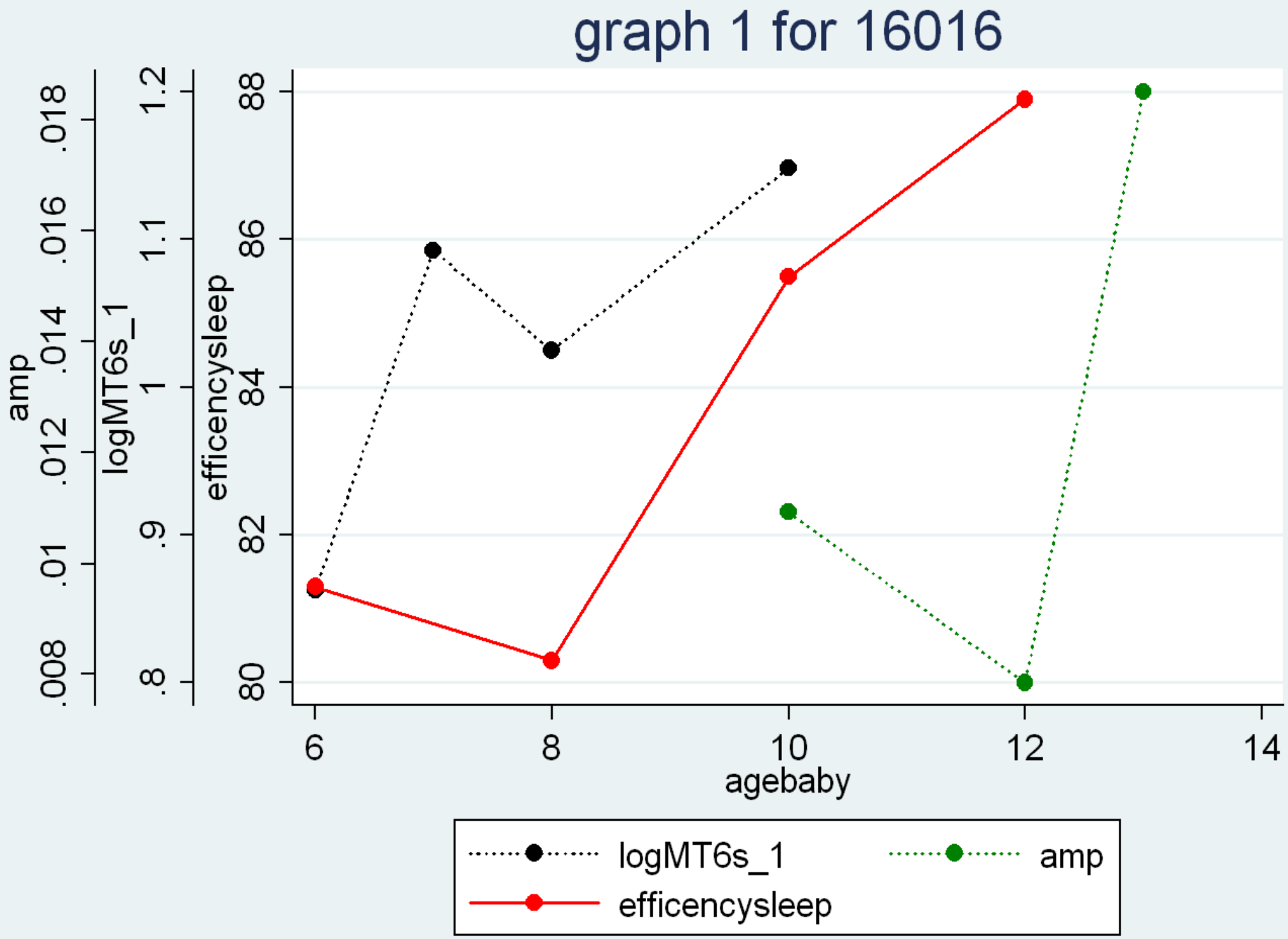
Table showing results from the univariable linear model for achievement of maximum infant sleep efficiency when temperature maturity achieved and lone sleeping as independent predictor values.

Case study

Infant 16016
Female; term infant
High socioeconomic class
Non smoking
Bottle feed
Room sharing

Infant rearing parent programme

Feeds and naps – regulated
Sleep environment – melatonin promoting
Zeitberger manipulation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1
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efficencysleep
80
82
84
86
88
6
8
10
12
14
agebaby
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Sleep and feeding

- Sleep practice and feeding
- Variation by race & culture
- Physiological maturation varies
- Advanced in South Asian infants
- Delayed in Afro-Caribbean infants

Conclusions

- Infant circadian rhythms not present at birth
- Rhythm maturation in postnatal period
- Complex relationship infant feeding and sleep
- Interplay environmental factors and intrinsic factors
- Future research