Sleep states in infants and toddlers.

Melissa N. Horger

Research Day 2021
What does infant sleep look like?

Knoop, de Groot, & Dudink, 2020
Distinguishing REM from NREM

Differences:
- Neurological signatures
- Observable behaviors
- Cardiorespiratory rates
Distinguishing REM from NREM

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Distinguishing REM from NREM

Differences:
- Neurological signatures
- Observable behaviors
- Muscle twitching
- Cardiorespiratory rates
The need for methodological creativity in studying infant sleep

- Minimally invasive
- Easy-to-use
  - Parents can apply it
  - Worn for more than one day/night

Current study goal:

to test the feasibility of a new methodology for state coding in infants and toddlers
Novel methodological technique

Use both movement and cardiorespiratory parameters

Lifetouch sensors

Actigraphy
Participants

10 infants aged 12 months (+/- 3 weeks)
• 6 male/4 female
• 7 White, 2 Hispanic, 1 Black/Asian Pacific Islander/White

Each infant participated for 5 nights
State coding

1. Actigraphy identified:
   i. Sleep start
   ii. Sleep end
   iii. Wake episodes during the night
State coding

2. Heart and respiratory rates identified:
   i. REM
   ii. nonREM
   iii. indeterminate sleep
Results
State coding – Take 2

REM (1:59-2:30 AM)
Results

![Bar graph showing proportion of sleep states across subjects. The graph compares NREM (yellow bars) and REM (blue bars) sleep states for subjects 1 to 10. Each subject has a variable proportion of the two sleep states.](image-url)
Results
Next steps

• Applying this technique in conjunction with other paradigms