

## Adolescent Sleep in the Digital Age

Dr Stephanie Centofanti  
B. Psych Hons, PhD (Psychology)

Research Fellow, Sleep & Chronobiology Laboratory,  
Behaviour-Brain-Research Centre  
University of South Australia  
Stephanie.Centofanti@unisa.edu.au



## Conflict of Interest

The author reports no conflict of interest in relation to the material presented within this presentation.

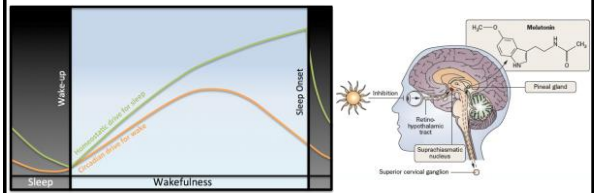


## Overview

- Normal sleep processes, recommended sleep durations and consequences of inadequate sleep
- Barriers to good adolescent sleep
- Advice for helping adolescents manage sleep
  - Cognitive behavioural therapy
  - Light therapy
  - Sleep hygiene interventions

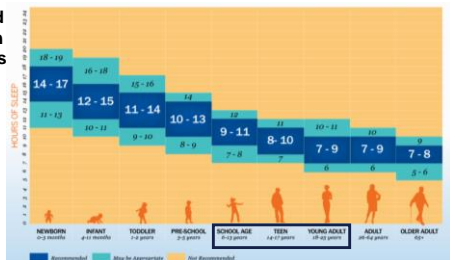


## Regulation of the Sleep/Wake Cycle



SCN Image:  
<http://www.healthsciencenews.com>

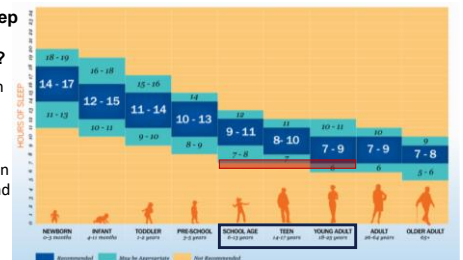
## Recommended Sleep Duration for Adolescents



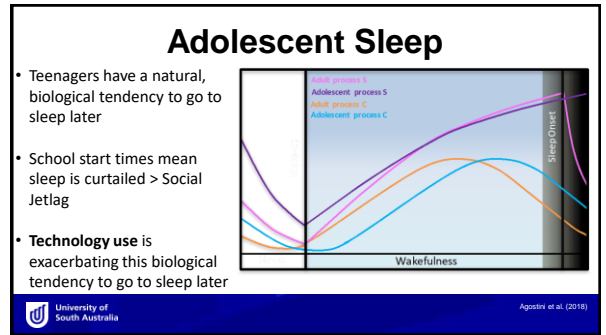
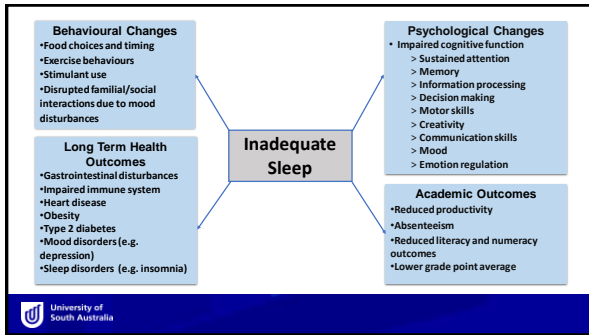
NATIONAL SLEEP FOUNDATION

## How Much Sleep Are Australian Teens Getting?

South Australian & Victorian adolescents obtain 6.5-7.5 hours of sleep on school nights and ~8.5h on weekends.



Bee et al. (2014)  
Luchington et al. (2015)



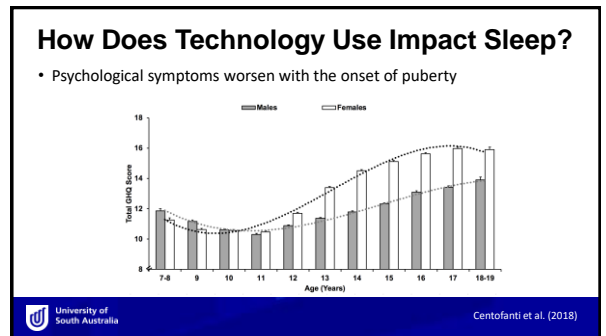
## Teens and Technology Use

- Can include: social media, instant messaging, gaming, gambling, TV, etc.
- 75% of adolescents have at least one electronic device in the bedroom
- 16% report reading or sending emails and messages after initially going to sleep
- 97% use technology before sleep
- **Technology use at night is associated with later bedtime, reduced total sleep time and poor sleep quality**

Data across >180,000 children, eight-16 years reveals that 25% of year three students text-message at night during the hours of 10pm-6am

This is increased to 83% by year 12

National Sleep Foundation (2014)  
Dorrian et al. (2018)  
Barzel et al. (2018)



## Tech Use Exacerbates Mental Health Symptoms

- **Mental stimulation/anxiety:** Social media use before bed is related to higher levels of pre-sleep cognitive arousal, increasing the amount of time taken to fall asleep (Harbad et al., 2016).
- *Technology use can worsen mental health symptoms directly*
  - Overuse of technology can reduce autonomy in adolescents
  - Being cut off from online communications can lead to 'FOMO' and increased anxiety
  - Social media use of more >2 hours per day associated with worse mental health in adolescents.

University of South Australia | Dorrian et al. (2018)  
Reynolds et al. (in press)

## Tech Use Exacerbates Mental Health Symptoms

- *Technology use can worsen mental health symptoms via sleep loss, resulting in a vicious cycle of poor sleep and mental health*
- *Emotional disturbances caused by sleep loss can contribute to social/communication difficulties which then contributes to the stress-sleep loss cycle*

*Sleep / Stress Merry go Round*

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University of South Australia | Dorrian et al. (2018)  
Reynolds et al. (in press)

## How Does Technology Use Impact Sleep?

- **Melatonin:** Evening light (particularly blue wavelength from devices) suppresses melatonin secretion and delays sleep in adolescents (Bedrosian & Nelson, 2017)



## Clinical Approaches

- Technology use is having a profound impact on sleep and consequently on daytime functioning and health of adolescents
- Given the bidirectional link between sleep and health – ask adolescents about their sleep and technology use, especially when they present with mental health symptoms
- Many adolescents are 'addicted' to their devices – changing this behaviour is hard and the brain takes time to cease the neurochemical response at night; thus having a holistic approach to sleep hygiene is helpful

## Clinical Approaches

To improve sleep, and therefore mental health in adolescents, the following treatment options have been shown to be successful.



## Clinical Approaches

### Cognitive behaviour therapy for insomnia (CBTi)

- Often involves a combination of sleep psychoeducation, sleep hygiene, sleep restriction therapy, stimulus control therapy, relaxation and cognitive therapy

CBTi improves sleep duration, sleep efficiency, sleep quality and mental health

## Clinical Approaches

### Bright Light Therapy (BLT)

- Effective for delayed-sleep wake phase disorder (DSWPD)
- 52% Australian adolescents meet at least one diagnostic criterion of DSWPD
- Involves changing sleep timing through appropriately timed bright light i.e. bright light administered in the morning to advance circadian rhythm and encourage earlier sleep timing

BLT improves late sleep onset time, time taken to fall asleep and mental health

## Clinical Approaches

### Educating adolescents (and parents) about Sleep Hygiene

- Education on practices which promote good sleep
- Behavioural changes rather than pharmacological approaches – there is limited evidence for efficacy of exogenous melatonin
- RCTs and controlled trials support efficacy of sleep hygiene interventions for improving sleep
- School sleep education interventions often not successful in long term

## Sleep Hygiene

### Cutting down on technology use

- In South Australian adolescents, prohibiting mobile phone use for 1 hour before bed resulted in lights out being 17min earlier, and 21min more sleep per night (an extra 1h 45min over the school week)
- HOWEVER...instant messaging has been shown to:
  - foster friendship quality
  - contribute to the wellbeing of distressed adolescents
  - develop a sense of belonging and self-disclosure
- Interventions must consider the benefits and potential losses associated with change.



## Sleep Hygiene

### Light exposure

- Exposure to natural light during the day, particularly in the morning is important to keep the circadian rhythm in sync
- Limiting evening light exposure is key
  - Dimming lights in the evening
  - Using 'Nightshift Mode' blue-light filtering apps
  - Having a technology buffer-zone before bed



## Sleep Hygiene

### Routine

- Having a consistent bedtime/wake routine regardless of school day vs weekend
- Minimise after school naps to avoid relieving sleep pressure necessary to fall asleep at night
- Having a 'wind down routine' cues the brain into feeling sleepy
- Stimulus control – only go to bed when sleepy, get out of bed if trouble sleeping, only use the bed for sleep

## Sleep Hygiene

### Caffeine, diet and exercise

- Limit caffeine for 6 hours before bed
- Avoid large meals late at night (may affect peripheral clocks)
- Engage in regular exercise (outdoor physical activity in the mornings can be useful for adolescents who have delayed sleep patterns)



## Sleep Hygiene

### Comfortable sleep environments

- Bedrooms must be:
  - Cool
  - Quiet
  - Dark
- Adolescents who live in chaotic households may obtain less sleep



## Sleep Hygiene

### Stress reduction

- Cognitive therapy to reduce maladaptive sleep- or technology-related beliefs
- Relaxation techniques to reduce physiological arousal (e.g. progressive muscle relaxation)
- Mindfulness-based therapies (e.g. meditation)
- Addressing the source of stress that is leading to sleep difficulties

## Clinical Approaches

- Psychoeducation: for adolescents and parents (prioritising and discussing sleep, modeling good behaviours and setting limits for tech use to encourage self-regulation; remember positives to some tech use)
- Early intervention is key: sleep problems as a toddler predict anxiety and depression in adolescence (Becker et al., 2015)



<http://dubi.blog/teaching-kids-to-use-technology-responsibly/>

https://www.sleephealthfoundation.org.au

Sleep Health Foundation

About Us For Everyone

### Sleep Health Fact Sheets

The Sleep Health Foundation has prepared a number of fact sheets about sleep related topics. These are a guide and not to be used as medical information. Please see your GP or a specialist for specific conditions and problems.

Title	Modified Date
ADHD and Sleep in Children	2023/10
Advanced Sleep Phase Disorder (ASPD)	11/04/18
Attentional Deficit Hyperactivity Disorder (ADHD), Sleep and Sleep Hygiene	21/07/18
Anxiety and Sleep	04/07/18
Depression	11/04/18
Behavioural Sleep Problems in School Aged Children	01/04/18
Body Clock	06/04/18

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Adolescents are only getting between 6.5 and 7.5 hours of sleep on school nights

Sleep and mental well-being: exploring the links

<https://www.sleephealthfoundation.org.au/public-information/special-reports/sleep-and-mental-wellbeing.html>

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## Take Home Messages

- Adolescents have a biological tendency to fall asleep late
- High rates of technology use are exacerbating sleep disturbances and related health issues (e.g. mental distress)
- For clinical sleep disorders, CBTi and BLT may be effective
- For other sleep issues, sleep hygiene interventions can improve sleep
- Changing behaviours is difficult; it takes time to see changes to sleep timing and quality. Small steps (e.g. no phone use for 1 hour before bed) may gradually improve sleep

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