Insomnia in School-Aged Children & Adolescents
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Faculty Disclosure

- I have no actual or potential conflict of interest in relation to this presentation

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Educational Objectives

At the end of this session the learner will be able to:

- describe the factors that contribute to insomnia and be able to identify the negative impact insomnia can have on children/youth and families
- list the ways to assess for insomnia in school-aged children and adolescents
- explain how to treat insomnia in school-aged children and adolescents
Session Overview

- What is insomnia
- Contributing factors and consequences
- Assessment
- Treatment
- The ABCs of SLEEPING tool
- Questions & Answers

Case Study: Alex

- 10 year old boy
- Only child
- Parents divorced; Alex lives mostly with mom but stays at his dad's house every second weekend
- Trouble falling asleep (long standing but worse over past year)
- Once asleep stays asleep
- Trouble waking up in morning, results in lots of stress
- Parents and teachers think that Alex seems tired during the day
- Has ongoing academic problems, low energy and at times he's irritable

Prevalence

<table>
<thead>
<tr>
<th>Disorder</th>
<th>Prevalence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sleep-related movement disorders</td>
<td>1-2%</td>
</tr>
<tr>
<td>Sleep Disordered Breathing</td>
<td>2.3%</td>
</tr>
<tr>
<td>Circadian rhythm disorders</td>
<td>7%</td>
</tr>
<tr>
<td>Parasomnias</td>
<td>25%</td>
</tr>
<tr>
<td>Insomnia</td>
<td>20-30%*</td>
</tr>
</tbody>
</table>

* 70%+ for children with NDDs

**Insomnia – Developmental Prevalence**

<table>
<thead>
<tr>
<th>Developmental Period</th>
<th>Prevalence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Infants/Toddlers</td>
<td>~90%</td>
</tr>
<tr>
<td>Preschoolers/School-aged</td>
<td>~15%</td>
</tr>
<tr>
<td>Adolescents (peak at puberty)</td>
<td>~30%</td>
</tr>
<tr>
<td>Adult</td>
<td>~15%</td>
</tr>
</tbody>
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Insomnia

- Criteria (ICSD-3 & DSM-5)
  - Difficulties falling asleep/difficulty initiating sleep without parent/caregiver intervention, staying asleep, and early waking (resistance to going to bed; ICSD-3 only)
  - Impairment/Daytime consequences of sleep problem (e.g., daytime sleepiness, attention problems, mood disturbance/irritability, behaviour problems, low motivation/energy/initiative)
  - Sleep problem cannot be explained by inadequate opportunity for sleeping
  - Frequent (≥3x/wk) and chronic (≥3 mos)
  - Not explained by or occur exclusively during another sleep-wake disorder, medical condition, or mental health disorder

Common Presentations

- Children
  - sleep-onset association
  - limit-setting

- Adolescents
  - poor sleep practices
  - delayed sleep phase

- Young Adult
  - psychophysiological insomnia

  (With/without psychiatric comorbidity)

How much sleep do children need?

[Image: https://sleepfoundation.org/how-sleep-works/how-much-sleep-do-we-really-need]
Assessment of Insomnia

BEARS sleep screening tool
- Bedtime Issues
- Excessive Daytime Sleepiness
- (Night) Awakenings
- Regularity and Duration of Sleep
- Snoring


Questionnaires

Lewandowski et al., 2011
- Review of Pediatric Questionnaires (n=21)
- Multidimensional sleep measures received the highest ratings
  - “Well Established”
  - Brief Infant Sleep Questionnaire (Sadeh, 2004) (0-29 months)
  - Infant Sleep Questionnaire (Moore, 1999) (12-18 months)
  - Child Sleep Habits Questionnaire (Owens et al., 2005) (2.5-10 years)
  - Preschool Sleep Questionnaire (Brooke, 1998) (2-5 years)
  - Pediatric Sleep Disturbances Scale (Durie et al., 2003) (14-13 yrs)

Ji & Liu, 2016
- Review of Adolescent Questionnaires (n=13)
- Most validated questionnaires
  - Cleveland Adolescent Sleepiness Questionnaire (Spilsbury et al., 2007) (11-17yrs)
  - Chronic Sleep Reduction Questionnaire (Donald et al., 2012; Meijer, 2008; 12-16.5 yrs)


Children’s Sleep Habits Questionnaire

- Total Sleep Disturbances (Cut-off = 41)
- Record of sleep and wake times and related information
- Completed by parent and/or child
- Commonly used in clinical practice
- Examines for patterns across days/weeks


Corkum, et al. (unpublished)

http://www.sleepforkids.org/pdf/SleepDiary.pdf

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- Completed by parent and/or child
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Sleep Diaries

http://www.sleepforkids.org/pdf/SleepDiary.pdf
Actigraphy

- An actigraph is a wrist-watch-like device with an accelerometer used to measure movement.
- Computer algorithms are used to interpret accelerometer-based findings as measures of sleep and waking.
- Actigraphy has become an increasingly popular method for estimating sleep parameters in both research and clinical studies over the past 30 years.

Data Example: Normal Sleeper
What does this actigraph result show?

Polysomnography (PSG)
- Considered the gold standard for measuring sleep
- Measures:
  - Brain waves/activity
  - Oxygen level
  - Breathing
  - Heart rate
  - Eye and leg movements

Treatment
### Best Practices: Treatment

1. Address underlying conditions
2. Psychoeducation
3. Implementation of healthy sleep practices
4. Specific behavioural sleep interventions
5. Medication

### 1. Psycho-education

- Sometimes sleep problems are a result of lack of knowledge and due to faulty beliefs, for example:
  - Expecting the child to sleep too long/too little
  - Lack of understanding of circadian rhythms and sleep pressure
  - Expecting child to have same chronotype as parents (e.g., owl/lark)
  - Thinking that keeping the child up later will result in the child sleeping in later in the morning
  - Thinking that arousals at night are not typical (rather than seeing this as self-soothing problem)
  - Not understanding the biological shift in sleep time during adolescents
2. Implementation of healthy sleep practices

Age appropriate Bedtimes, wake-times and naps, with Consistency Schedule and routines Location no Electronics in the bedroom or before bed Exercise and diet Positivity and relaxation Independence when falling asleep Needs met during the day …all of the above equals Great sleep!

Visual Schedule

Slide courtesy of B. Malone

3. Specific Behavioural Interventions

Slide courtesy of B. Malone


Specific Sleep Strategies

- Goal typically involves some combination of developing positive sleep-related associations, establishing routines, and implementing relaxation/self-soothing skills.
- Strong evidence for sleep intervention programs with TD:
  - 94% of studies found behavioural interventions to be effective.
  - 80% of children had clinically significant improvements.
  - Improvements in sleep onset latency, frequency and duration of night wakings and sleep efficiency (not sleep duration).
  - Improvements lasted 3 to 6 months.
  - Few studies on children with special needs.

Mindell et al., 2006; Meltzer & Mindell, 2014

Extinction

- “Cry it out” technique
- Very effective but low tolerance of this technique from parents
- Usually use an alternative extinction techniques
Extinction with parent presence

- Put child to bed and turn out the lights at the pre-set time
- Over a week or two, gradually remove parents presence in child's room while he or she falls asleep
- Parent should not interact with child during this time
- If child gets out of bed, parent should return child to bed with minimal interaction
- Use of 1 free pass and reward programs can be helpful

Graduated Extinction

- Put child to bed and turn out the lights at the pre-set time
- Once lights are out, limit responses to child's calls for attention for a pre-set length of time
- The length of time starts at 5 minutes and gradually increases to 20 or more minutes
- During checks minimal interaction should happen between parent and child
- Use of 1 free pass and reward programs can be helpful
- Door holding may be needed

Bedtime Fading with Response Cost

- Put child to bed ~30 minutes later than when child usually falls asleep – the idea is that they will be more tired than usual and fall asleep quicker
- If child does not fall asleep within 20 minutes of this new bedtime, then child needs to get out of bed and complete a low interest activity for 20 minutes, prior to putting them to bed again
- This 20-minute routine continues until child falls asleep within that 20-minute time frame
- Once the child is successful falling asleep at that time, then the new bedtime is set which is 20 minutes earlier
- The same process is followed until the child reaches the appropriate bedtime
- One free pass and reward program can be used
Relaxation Training

- Teach diaphragmatic (belly) breathing and progressive muscle relaxation to reduce arousal
- Need to practice regularly before introducing this at bedtime

Stimulus Control

- Making the bedroom/bed a discriminant stimulus for sleep
- Want to break the association between the bedroom/bed and insomnia and build the sleep compatible associations
- Remove all distractions (e.g., electronics) and use the bedroom/bed for only sleep (not play, time-outs, etc.)
- If youth cannot fall asleep within 15-20 min, he/she should get out of bed and do an calm activity and try again in 20 min

Sleep Restriction

- Restrict time in bed to the hours needed for healthy sleep
- Consistent bedtime and wake time
- Helps to strengthen the circadian rhythm and increase sleep drive
- Usually combined with stimulus control
- Time in bed is slowly lengthened once sleep efficiency has improved
- Contraindicated in youth with parasomnias, seizure disorders, OSA, mania
Cognitive Strategies

- These strategies are used to address non-productive beliefs about sleep
  - With parents this may include addressing the belief that the child cannot change their sleep difficulty
  - Misinformation about sleep
  - Faulty beliefs and schemas

- CBT-i uses a combination of healthy sleep practices, behavioral techniques, and cognitive restructuring

4. Medication

- Children presenting with insomnia are being prescribed medication at high rates, especially when child has a NDD (Stojanovski et al., 2007; Owens et al., 2010)
  - e.g., antidepressants, atypical antipsychotics, anticonvulsants, beta-blockers

- No FDA approved medications for treatment of insomnia in children and there are concerns about the safety and side effects of these medications (Owens et al., 2010)

- Pharmacological treatments may have rapid short-term effects on sleep problems, but typically do not have long-term positive effects on sleep
Melatonin

- Melatonin is secreted by the pineal gland in response to darkness and is involved in maintaining the circadian rhythm of the sleep-wake cycle
- Melatonin supplements provide much larger amount than what is typically secreted
- Studies that exist find benefit and few side-effects
- Short-acting forms used to treat sleep onset problems and long acting forms to treat sleep maintained problems
- However, studies include small sample sizes and do not assess long-term use
- Canadian Pediatric Society Position Paper re: Melatonin

https://choosingwiselycanada.org/
First step in management of all sleep disorders is establishing good sleep hygiene.

All studies have involved small numbers of subjects and address only short-term use.

No good data concerning the safety and efficacy of long-term melatonin use.

Further studies are needed to confirm the usefulness and safety of melatonin for sleep disorders in children and adolescents.

2012, Reaffirmed 2015

New Assessment Tool

Age-appropriate
Bedtimes, wake-times and naps, with
Consistency
Schedule and routines
Location
no Electronics in the bedroom or before bed
Exercise and diet
Positivity and relaxation
Independence when falling asleep
Needs met during the day
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Assessment Tool

• 26 items that assess the ABCs of SLEEPING
• Items ask parents to reflect on the most recent typical week and complete all questions
• Using computer algorithms the parent’s responses are compared to evidence (compiled from a systematic review) for that item and rated as:
  • All items with 0 or 1 stars are considered in need of intervention and as such a resource that includes intervention strategies for each area is generated

Screenshots of online assessment tool

“Report Card”
HCP gives weblink to parents

Parents complete online assessment tool

"Report Card" is generated and shared with parents and HCP

Resources automatically shared with parent and HCP

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**Process**

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**Resource Examples**

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Case Study Questions

- What additional information would you like to know about Alex prior to diagnosing insomnia?
- What treatment plan would you suggest for Alex?
- Which areas of the ABCs of SLEEPING do you think might be most problematic for Alex?

How would you change your assessment and treatment approach in these situations?

- Alex has ADHD and is on stimulant medication?
- Alex has ASD and an anxiety disorder?

Better Nights, Better Days

A comprehensive eHealth behavioural treatment program for parents of typically developing children aged 1-10 years with insomnia

- Delivers efficient, interactive, and tailored content online
- National RCT launched September, 2016
- ~550 Participants currently enrolled
- Funded by CIHR

http://betternightsbetterdays.ca/
http://nnd.betternightsbetterdays.ca/
Web Resources

- Canadian Sleep Society
  - [http://www.css.to/](http://www.css.to/)
- National Sleep Foundation
  - [http://www.sleepfoundation.org](http://www.sleepfoundation.org)
- Star Sleeper
  - [http://www.professorgarfield.org/pgf_StarSleeper_crf.htm](http://www.professorgarfield.org/pgf_StarSleeper_crf.htm)
- Insomnia Rounds
  - [http://www.insomniarounds.ca](http://www.insomniarounds.ca)

Books


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