IMPACT OF SCHOOL START TIMES ON ADOLESCENTS

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Making teens wake for school before 7 a.m. — which is like adults waking at 4 a.m. every day — causes chronic sleep loss. The American Academy of Pediatrics advises that middle and high schools begin no earlier than 8:30 a.m.

Tell our elected officials and school administrators to #StartSchoolLater. Support healthy school hours for all children.

startschoollater.net
OUTLINE

- Overview of healthy sleep in children
- Impact of insufficient sleep on children’s learning and health
- Implications for school start time
# Children’s Sleep Needs

<table>
<thead>
<tr>
<th>Age</th>
<th>Ideal Sleep Duration</th>
<th>Sleep Patterns</th>
</tr>
</thead>
<tbody>
<tr>
<td>3-6 years</td>
<td>11-12 hours</td>
<td>Naps stop around 5 years of age</td>
</tr>
<tr>
<td>6-12 years</td>
<td>10 hours</td>
<td>Discrepancy between school and non-school nights</td>
</tr>
<tr>
<td>12 years+</td>
<td>9 hours</td>
<td>Later bedtimes</td>
</tr>
</tbody>
</table>
Why do Children and Adolescents Need Sleep?

- Growth hormone is released during sleep
- Sleep consolidates learning and promotes cognitive development
- Elementary aged children with good sleep habits report increased satisfaction with school and better academic performance.
- For children to adequately grow and develop cognitively, we must promote healthy sleep habits from infancy through adolescence.

Meijer et al., 2000
SECONDARY EFFECTS

- Insufficient sleep in children may lead to problems with:
  - Cognitive development
  - Mood regulation
  - Attention
  - Behavior
  - Health
  - Quality of life
  - Family functioning
Insufficient Sleep
Insufficient Sleep

National Sleep Foundation 2004; 2006
IMPACTS OF SHORTER SLEEP DURATION

- Executive functioning
- Cognitive abilities
- Academic performance
- Memory
- Behavior problems
- Emotional problems
- Greater impact on performance in girls

Astill et al., 2012; Paavonen et al., 2010; Curcio et al., 2006; Kopasz et al., 2010
Severe Sleep Restriction

- After one night of severe restriction, both children and adolescents have impairment in:
  - attention
  - verbal creativity
  - abstract thinking
  - concept formation

- Reflects poor executive functioning
- Individual susceptibility

Fallone et al., 2001; Randazzo et al., 1998
**Sleep Loss in Adolescents**

- Middle and High School Students with lower grades (Mostly Cs, Ds, and Fs):
  - Obtain less sleep on school nights
  - Have later bedtimes on school nights
  - Sleep later on weekends
- 21% of poor sleepers had school failures and were behind in grade level by one or more years

*Wolfson & Carskadon, 1998; Kahn et al., 1989*
CIRCADIAN CHANGES IN ADOLESCENCE

- Biological changes occur with the onset of puberty
- Delayed sleep onset with delayed wake times
- Early school start times interfere with sleep duration

***It’s not just the iPads***

Crowley et al., 2007; Owens et al., 2010
IMPLICATIONS FOR SCHOOL START TIMES

- Delayed sleep onset coupled with early school start times are associated with:
  - excessive daytime sleepiness
  - falling asleep in class
  - inattention
  - decreased school performance

- Initial moves to early middle and high school start times related to bus cost savings
  - No science to support this
  - Resulted in negative impact to most vulnerable group
EXPERIENCES FROM DELAYED SCHOOL START TIMES

- 1997-1998 academic year, high school start times delayed in the Minneapolis and Edina Public Schools
- Moved from 7:15 am to 8:40 am.
- No later bedtimes than those with earlier school start times
- Later wake times
- Increased total sleep time of almost one hour per night
- Attendance rates and continuous enrollment improved
- Significantly fewer symptoms of depression
- Significantly less excessive daytime sleepiness
- Number of students participating in after-school activities did not change
MIDDLE SCHOOL STUDENTS ARE ALSO AFFECTED

- 8:37 am (L) vs. 7:15 am (E) start time
- School L students with average of 50 minutes more sleep per night

![Bar chart showing distribution of school-night total sleep times for early- vs. late-starting middle schools.](image)

**FIGURE 1** Distribution of school-night total sleep: Early- versus late-starting middle schools.

Wolfson et al., 2007
# Late vs. Early Middle School Start Time

## Table 5

Means and Standard Deviations for Fall Academic Performance, Tardiness, and Absenteeism Rates

<table>
<thead>
<tr>
<th>Variable</th>
<th>School E</th>
<th></th>
<th>School L</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>7th</td>
<td>8th</td>
<td>7th</td>
<td>8th</td>
</tr>
<tr>
<td>Grade point average*&lt;sup&gt;a&lt;/sup&gt;</td>
<td>83.16</td>
<td>76.85</td>
<td>80.46</td>
<td>83.79</td>
</tr>
<tr>
<td>Tardies&lt;sup&gt;b&lt;/sup&gt;</td>
<td>3.18</td>
<td>6.99</td>
<td>0.94</td>
<td>1.20</td>
</tr>
<tr>
<td>Absences</td>
<td>2.96</td>
<td>3.80</td>
<td>3.20</td>
<td>2.48</td>
</tr>
</tbody>
</table>

<sup>a</sup> School × Grade Effect.  
<sup>b</sup> School effect.  
* *p < .001.

Wolfson et al., 2007
Newer Findings

- 9,000 high school students
- 8 high schools
- 5 districts
- 3 states
  - Colorado
  - Minnesota
  - Wyoming
- Ethnically and SES-diverse population

Wahlstrom et al., 2014
NEWER DELAYED SCHOOL START TIME FINDINGS

- High schoolers with school start times at 8:30 am or later have improvements in:
  - Sleep
  - Grades
  - Standardized test scores
  - Attendance
  - Graduation rates

- 60% obtain at least 8 hours of sleep on weeknights
  - Later the start time, the more students with > 8 hours of sleep

Wahlstrom et al., 2014
NEWER DELAYED SCHOOL START TIME FINDINGS

- High schoolers with a school start time of 8:30 am or later have less:
  - Tardies
  - Substance abuse
  - Caffeine use
  - Symptoms of depression
  - Motor vehicle accidents
    - Up to 70% fewer

Wahlstrom et al., 2014
RECOMMENDATIONS

- **2014 American Academy of Pediatrics Policy Statement**
  - Early start times (before 8:30 am) are a “key modifiable contributor to insufficient sleep”
  - Urges middle and high schools to have start times that allow for sufficient sleep (8.5 to 9.5 hours per night)

- **2015 Centers for Disease Control**
  - Urges school officials to:
    - Learn about research connecting sleep and school start times.
    - Good sleep hygiene + later school times improves health and academic achievement
QUESTIONS?