

My name is Wendy Werner, and I go to Rocky Heights Middle School. I am in 6<sup>th</sup> grade.

My bus comes very early – 7:00 a.m.

When my mom wakes me up at 6:00, I feel like skipping school. When I finally get up, it is all a big rush. Everyone is VERY GRUMPY.

My math class is first period, and I often have trouble staying awake. I put my head on the table. I yawn so much and my eyes get blurry. I start to feel better in period six, which is PE.

My mom makes me go to bed at 8:30 at night, but sometimes I can't go to sleep then. I'm still tired in the morning.

6:00 in the morning is just too early to get up.

And I'm not the only one.

Kate says that being at school at 7:30 is really "harsh" on her and her family.

Emma says that school is too early. It's hard for her to concentrate.

Tara says that she struggles to stay awake in class.

Josie says "FINALLY, SOMEONE UNDERSTANDS THAT SCHOOL STARTS TOO EARLY!!"

And Chloe was so tired that she already skipped school one day.

I haven't been going to middle school for very long, but already the early start time has been affecting my concentration and my learning.

At school, I saw on CNN student news that if we don't get enough sleep, we get sick more. And people who don't get enough sleep often eat more unhealthy food and get overweight.

One hour makes a huge difference.

Thank you,

September 9, 2015

Dear Members of the *School Safety and Youth-in-Crisis Committee*:

Last week, I wrote to you about teen sleep deprivation. Because it puts student health and safety at risk, this issue is of great concern to me. Today, I would like to share more information from experts.

An *American Psychological Association* study found that students who began school at 7:20 a.m. were "*pathologically sleepy*" by 8:30 a.m., falling directly into REM sleep in an average of only 3.4 minutes—a pattern similar to patients with narcolepsy. The study goes on, "*Also troubling are findings that adolescent sleep difficulties are often associated with psychopathologies such as depression and ADHD.*"

Cornell sleep expert James B. Maas, PhD. says, "*Almost all teen-agers, as they reach puberty, become walking zombies because they are getting far too little sleep.*"

Dr. Mary Carskadon, of Brown Medical School, says, "*These early school start times are just abusive. Kids may be up and at school at 8:30, but I'm convinced their brains are back on the pillow at home.*"

According to the *American Academy of Pediatrics*, chronic sleep deprivation aggravates depression, substance abuse, suicidal thoughts, school violence, absenteeism, and car crashes.

The Pediatric Sleep Disorders Clinic at Hasbro Children's Hospital found, "*Sleep deprivation is epidemic among adolescents, with potentially serious impacts on mental and physical health, safety and learning. Early school start times contribute to the problem.*"

According to the experts, the common-sense solution is to delay school start times until 8:30 or later. Most secondary schools in Colorado start before 7:45 a.m. My children's middle school in Douglas County starts at 7:30 a.m. and their bus comes at 7:00 a.m.

Dr. Judith Owens, of Children's National Medical Center, says, "*Delaying early school start times to 8:30 a.m. or later is one key factor that can help adolescents get the sleep they need to grow and learn.*"

According to criminal justice researcher, Ryan Meldrum, lack of sleep contributes to delinquent behavior. He says sleep deprivation leads to poor self-control, which contributes to juvenile crime.

Anne Gallagher is senior research consultant for *Lloyd Society* in Maryland, which treats at-risk youth. "*For every hour of reduced sleep, the increase in crime is greater and the level of violence greater still,*" she says. Gallaher adds that insufficient sleep is associated with a wide range of risky behaviors, including substance abuse, sexual activity, and aggression.

We have authorities here in the Denver area who can also speak on this subject:

Dr. Lisa Metzler, a National Jewish sleep specialist, said "*We have tons of evidence showing [that] even small differences in sleep make a lot of difference in behavior,*" in the *Denver Post* on March 6, 2015.

Principal Avi Tropper, of Northfield High School in Stapleton of Denver, says his school starts at 8:45 a.m. because "*Research on adolescent biorhythms has conclusively shown that a later start time for the school day aligns to student needs.*"

Districts should not require teenagers to start school at times that hurt them mentally and physically. For some at-risk kids, the early morning strain may be the final straw. To prevent crimes and crises, and to support teen mental health and safety, I hope you will recommend delaying school start times.

Patricia Werner  
303-660-8663

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## Sleep deprivation may be undermining teen health

Lack of sufficient sleep—a rampant problem among teens—appears to put adolescents at risk for cognitive and emotional difficulties, poor school performance, accidents and psychopathology, research suggests.

By SIRI CARPENTER

*Monitor Staff*

October 2001, Vol 32, No. 9

Print version: page 42

On any given school day, teen-agers across the nation stumble out of bed and prepare for the day. For most, the alarm clock buzzes by 6:30 a.m., a scant seven hours after they went to bed. Many students board the school bus before 7 a.m. and are in class by 7:30.

In adults, such meager sleep allowances are known to affect day-to-day functioning in myriad ways. In adolescents, who are biologically driven to sleep longer and later than adults do, the effects of insufficient sleep are likely to be even more dramatic—so much so that some sleep experts contend that the nation's early high-school start times, increasingly common, are tantamount to abuse.

"Almost all teen-agers, as they reach puberty, become walking zombies because they are getting far too little sleep," comments Cornell University psychologist James B. Maas, PhD, one of the nation's leading sleep experts.

There can be little question that sleep deprivation has negative effects on adolescents. According to the National Highway Traffic Safety Administration, for example, drowsiness and fatigue cause more than 100,000 traffic accidents each year—and young drivers are at the wheel in more than half of these crashes.

Insufficient sleep has also been shown to cause difficulties in school, including disciplinary problems, sleepiness in class and poor concentration.

"What good does it do to try to educate teen-agers so early in the morning?" asks Maas. "You can be giving the most stimulating, interesting lectures to sleep-deprived kids early in the morning or right after lunch, when they're at their sleepest, and the overwhelming drive to sleep replaces any chance of alertness, cognition, memory or understanding."....

Also troubling are findings that adolescent sleep difficulties are often associated with psychopathologies such as depression and attention deficit hyperactivity disorder (ADHD)....

Almost half of the students who began school at 7:20 were "pathologically sleepy" at 8:30, falling directly into REM sleep in an average of only 3.4 minutes—a pattern similar to what is seen in patients with narcolepsy....

Those findings, says Mary A. Carskadon, PhD, of Brown University Medical School, persuaded her that "these early school start times are just abusive. These kids may be up and at school at 8:30, but I'm convinced their brains are back on the pillow at home."...

Just as important as the question of why sleep patterns change during adolescence is the issue of how sleep deprivation influences adolescents' emotion regulation and behavior. Many researchers have noted that sleep-deprived teen-agers appear to be especially vulnerable to psychopathologies such as depression and ADHD, and to have difficulty controlling their emotions and impulses....

With such a wealth of evidence about the prevalence of adolescent sleep deprivation and the risks it poses, many sleep researchers have become involved in efforts to persuade school districts to push back high-school starting times so that teens can get their needed rest.

Some schools argue that adjusting school schedules is too expensive and complicated. But others have responded positively to sleep experts' pleas. The Connecticut legislature is considering a bill that would prohibit public schools from starting before 8:30 a.m., and Massachusetts lawmakers are also weighing the issue. And Lofgren's "Zzzzz's to A's" bill, first introduced in the U.S. House of Representatives in 1998, would provide federal grants of up to \$25,000 to school districts to help cover the administrative costs of adjusting school start times...

"Changing school start times is one critical measure we can take to protect young people's sleep," says psychologist Amy R. Wolfson, PhD, of the College of the Holy Cross. "And then, if we can only understand what's going on with sleep in these sixth-, seventh- and eighth-graders, we can intervene to change their sleep behavior before it gets out of hand."

For the full article, see the above website



TECHNICAL REPORT

# Insufficient Sleep in Adolescents and Young Adults: An Update on Causes and Consequences

Judith Owens, MD, MPH, FAAP, ADOLESCENT SLEEP WORKING GROUP, and COMMITTEE ON ADOLESCENCE

**KEY WORDS**

adolescents, caffeine, car crashes, media use, obesity, sleep loss, sleepiness

**ABBREVIATIONS**

REM—rapid eye movement

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## abstract



Chronic sleep loss and associated sleepiness and daytime impairments in adolescence are a serious threat to the academic success, health, and safety of our nation's youth and an important public health issue. Understanding the extent and potential short- and long-term repercussions of sleep restriction, as well as the unhealthy sleep practices and environmental factors that contribute to sleep loss in adolescents, is key in setting public policies to mitigate these effects and in counseling patients and families in the clinical setting. This report reviews the current literature on sleep patterns in adolescents, factors contributing to chronic sleep loss (ie, electronic media use, caffeine consumption), and health-related consequences, such as depression, increased obesity risk, and higher rates of drowsy driving accidents. The report also discusses the potential role of later school start times as a means of reducing adolescent sleepiness. *Pediatrics* 2014;134:e921–e932

## INTRODUCTION

Since the publication of the American Academy of Pediatrics technical report on excessive sleepiness in adolescents in 2005,<sup>1</sup> there have been a considerable number of articles published pertaining to sleep. These articles expand on many of the topics raised in the original report and add a number of new important health issues not previously or minimally discussed (ie, short sleep and its association with obesity, caffeine/stimulant use). The previous technical report provided an overview of the profound changes in sleep-wake regulation and circadian biology occurring during adolescence, outlined factors (ie, parental influence, school start times) contributing to insufficient sleep in adolescents, and summarized consequences such as negative impacts on mood, attention, and school performance. It also focused in particular on clinical sleep disorders such as insomnia, narcolepsy, and restless legs syndrome contributing to daytime sleepiness in adolescents. The new material in the present report adds to what is known about the extent of sleep restriction in the adolescent population and reinforces the importance of recognizing insufficient sleep both as a key public health issue and one that is immediately relevant to pediatric practice.

The focus of this updated technical report is on insufficient sleep, specifically as a consequence of voluntary sleep restriction. It should

be noted that such terms as insufficient sleep, inadequate sleep, short sleep duration, sleep loss, and sleep restriction are used interchangeably and as generic descriptive terms only and do not imply specific amounts but rather “less sleep than needed.”

Insufficient sleep in adolescents was recognized as a serious health risk in 2010 in a jointly sponsored American Medical Association/American Academy of Sleep Medicine resolution acknowledging the problem.<sup>2</sup> Furthermore, objectives for Sleep Health, a new topic in Healthy People 2020,<sup>3</sup> specifically includes reducing adolescent sleep loss: “SH-3: Increase the proportion of students in grades 9 through 12 who get sufficient sleep” (defined as  $\geq 8$  hours). A second focus of the present report is on unhealthy sleep behaviors (ie, poor “sleep hygiene”) in teenagers, including irregular sleep-wake patterns, electronic media use in the bedroom, and excessive caffeine use. A third focus is on the myriad of potential consequences of inadequate sleep in adolescents, including depression/suicidal ideation, obesity, car crashes attributable to drowsiness, and poor academic performance.

## EPIDEMIOLOGIC STUDIES OF SLEEPING ADOLESCENTS

Epidemiologic studies of sleep typically rely on self- or parent-reported questionnaire data to document adolescent sleep patterns and the factors affecting them. The key advantage of this method is the ease of assessment of large sample sizes. As a result, epidemiologic studies can determine sleep patterns across the full adolescent age range with less potential sampling bias than smaller case-control studies. Consistent with other methodologic approaches, the consensus finding across epidemiologic studies is that both younger<sup>4-6</sup> and older<sup>4,7-11</sup> adolescents are not getting enough sleep. It is important to

note that studies comparing self-reported sleep duration with objectively measured sleep amounts (ie, with actigraphy) suggest that self-reports of sleep often overestimate actual sleep duration, signifying that the problem of chronic sleep loss in adolescents may be even greater than the data indicate.<sup>12</sup> US-based<sup>4,13</sup> and international studies<sup>5,6,14</sup> revealed that as students get older, sleep durations decline. The National Sleep Foundation Sleep in America Poll<sup>4</sup> found that by the 12th grade, 75% of students self-reported sleep durations of less than 8 hours of sleep per night compared with 16% of sixth graders. Furthermore, although 30% to 41% of sixth through eighth graders were getting 9 or more hours of sleep, only 3% of 12th graders reported doing so. Adolescents often attempt to address the accumulated weekday sleep debt during the weekend, when oversleep (the difference between weekday and weekend sleep durations) of up to 2 or more hours is commonly reported.<sup>4,7,8,15,16</sup>

Comparisons with other countries show similar patterns of decreased sleep durations with increasing age among adolescents. For example, in Northern Taiwan,<sup>5</sup> Germany,<sup>14</sup> and India,<sup>17</sup> average sleep duration dropped to below 8 hours for high school-aged students. The most precipitous drop was reported in 2005 for more than 1400 South Korean adolescents, for whom the average duration of sleep was 4.9 hours.<sup>6</sup> In general, studies have demonstrated similar weekend sleep durations across countries, but weekday sleep durations tend to vary greatly.<sup>5,9</sup> In contrast, Australian adolescents seem to do comparatively well, with students 17 years and older reporting average sleep durations between 8.5 and 9.1 hours.<sup>18</sup> The difference between weeknight and weekend sleep durations also was not large, with weekend durations reported at 9.3 hours. Interestingly, although data on school start times in the Australian

study were not presented, the average reported wake times on school days was 7:00 AM or later, suggesting that the schools these students attended did not start before 8:00 AM.

A number of studies have indicated that sleep health disparities exist and that adults,<sup>19</sup> children, and adolescents<sup>20-22</sup> from families with low income or of racial or ethnic minorities may be at even greater risk of poor-quality and insufficient sleep. For example, in a recent study of middle school students, appropriate timing and consistency of both weeknight and weekend sleep schedules were inversely correlated with low socioeconomic status and specific household/neighborhood variables (eg, overcrowding, noise levels, safety concerns).<sup>23</sup> This relationship may have important health implications. For example, a recent study suggested that less sleep was a predictor of obesity risk in African-American adolescents but not in white adolescents.<sup>24</sup> “Missed” sleep was also reported to be an important factor in asthma morbidity, especially in Latino children.<sup>25</sup> However, higher socioeconomic status is not necessarily protective because studies have also shown that youth from households with higher socioeconomic status have shorter sleep durations.<sup>16,26</sup>

For older adolescents, additional environmental factors, such as after-school employment,<sup>16</sup> striving for good grades,<sup>5,6,12</sup> socializing,<sup>27,28</sup> participation in sports and other extracurricular activities, and lack of parental monitoring or rules about bedtimes, can further interfere with sleep durations.<sup>6,29,30</sup> School start times are reviewed later in the present report.

In summary, short sleep durations, coupled with evidence of daytime sleepiness (eg, increased self-reported sleepiness ratings,<sup>5,6,11,31</sup> daytime napping,<sup>5,14,26</sup> weekend oversleeping,<sup>6,10,14,32</sup> need for assistance in waking<sup>6</sup>), as well as increased use of fatigue countermeasures

## Researchers link sleep deprivation with criminal behavior

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Posted by JoAnn Adkins 11/21/2013 at 10:11 am

Lack of sleep can contribute to delinquent behavior by adolescents, according to an FIU study published earlier this month.

Researchers have long believed self-control is a trait developed in childhood, influenced by genetics, socialization and other developmental factors. Yet a new study published in the *Journal of Youth and Adolescence* suggests sleep deprivation can reduce self-control well after childhood and ultimately result in delinquent behavior among teenagers. In other words, adolescents who fail to get restful sleep on a regular basis are less able to effectively regulate their own behavior.

**Criminal Justice** researcher and lead author of the study **Ryan C. Meldrum** says low self-control is the link between lack of sleep and delinquent behavior. Data on more than 800 teenagers were evaluated for the study.

"The harmful implications of sleep deprivation is a largely under-studied area in criminal justice," Meldrum said. "Sleep offers us the opportunity for recuperation and restoration, which is especially important for developmental processes in children and adolescents. But even though sleep occupies roughly a third of our time, we are only now beginning to understand its function and the role it plays in antisocial behavior."

While the study acknowledges a variety of factors can lead adolescents to commit crimes, the correlation between sleep and cognitive function definitely require further study, according to Meldrum.

"These findings are particularly instructive in their implications," Meldrum said. "Whereas some factors linked to low self-control and delinquency are largely immutable, the quantity and quality of sleep that adolescents get is something that parents are in an excellent position to influence."

A member of the American Society of Criminology and the Academy of Criminal Justice Sciences, Meldrum focuses his research on juvenile delinquency, with particular attention given to peer associations and self-control during adolescence.



# Education Week

Published Online: March 15, 2013

## Experts Make a Case for Later School Start Times

By Gina Cairney

Mystery still surrounds what sleep is actually for, but multiple research studies suggest that it is critical to brain development, memory function, and cognitive skills, especially among children and teenagers, according to experts and advocates at a symposium here last week.

Organized by a pair of Maryland-based advocacy groups—the Lloyd Society and Start School Later—the event explored adolescents' need for sleep, and the effects of—and the necessity for—appropriate start times for schools across the country.

Sleep deprivation is considered a widespread, chronic health problem among adolescents, according to the Arlington, Va.-based National Sleep Foundation, and can have negative effects on their cognitive development and cause mental and emotional problems.

Experts recommend that high-school-age youths get around nine hours of sleep per night, but the reality is that many teenagers get seven hours or less, according to the sleep foundation.

Sleep changes in adolescents is "kind of a perfect-storm scenario," said Dr. Judith Owens, the director of sleep medicine at Children's National Medical Center in Washington, with many factors "basically conspiring to increase the risks of insufficient sleep in this population."....

"We need to start with the premise that 'it must be done,' " said Terra Ziporyn Snider, a medical writer, historian, and co-founder of Start School Later, "The science is now at a point where start times could really be changed, but it requires community involvement," she said. ....

When adolescents don't get adequate sleep, they experience health problems, according to the National Sleep Foundation, including impaired alertness and attention, which is important in academics but also important for those teenagers who drive to and from school.

Sleep deprivation can also inhibit the ability to solve problems, cope with stress, and retain information, and is often associated with emotional and behavioral problems such as depression and substance abuse.

The other conference co-sponsor, the Silver Spring, Md.-based Lloyd Society, an organization that studies at-risk youth populations, looked at whether sleep deprivation had an impact on youth behavior.

According to Ann Gallagher, one of the society's principal investigators, statistics show that violent crimes committed predominantly by teenagers tend to occur when school is out for the day, which implies that later end times could narrow the window of opportunity for such crimes.

The correlation between sleep and behavior still needs to be explored, but "for every hour of reduced sleep, the increase in crime was greater and the level of violence greater still," Ms. Gallagher said, citing

a 2011 meta-analysis published in Preventive Medicine that looked at data from the 2007 national youth risk-behavior survey by the Centers for Disease Control and Prevention, in Atlanta. The findings revealed that insufficient sleep was associated with a range of at-risk behaviors, including substance abuse, sexual activity, and aggression.

"Do we know why they're truant? No. Do we know why they're violent? No. Do we think this is exclusively related to school start time? No. But," Ms. Gallagher asks, "we can mitigate some of their life difficulties in a way to improve their outcomes."

Some schools may not have to start a full hour later like the Arlington public schools did. Dr. Owens of Children's National Medical Center suggested that even a modest change, say 30 minutes, can have a significant effect on teenagers' sleep habits, which then may have an impact on their health and academic performance.

Teenagers have erratic sleep cycles, Dr. Owens said, and they try to overcompensate during the weekend to "make up" for lost sleep, but the cycle just keeps going. "They're in a semi-permanent state of jet lag," she said.

The evidence, according to Dr. Owens, "is irrefutable. It's up to the community to decide whether to act on" it.

For full article, see website

March 6, 2015

# Daylight saving time can affect students, ER

By Electa Draper  
The Denver Post

Coloradans springing ahead Sunday with one more hour of evening daylight could be lurching into sleep problems, lower school test scores, greater risk of heart attack, elevated ER visits and traffic accidents associated with the lost hour of time, medical experts say.

"We have tons of evidence showing even small differences in sleep make a lot of difference in behavior," said National Jewish Health sleep expert Lisa Meltzer.

Students who suffer even small amounts of sleep deprivation have trouble focusing on their work, and research shows them testing a grade below their "expected" level, Meltzer said.

The pediatric sleep psychologist said it's particularly alarming that immediately following this temporal dislocation of daylight saving time, many Colorado schools on Monday will begin testing students, grades three through high school, on their mastery of state academic content standards.

"It would be easy to change when we give these assessment tests," Meltzer said. "It would make a real difference in performance."

Daylight saving time, adopted by 70 countries mostly to save energy costs, involves a twice-yearly, one-hour change in clock time that growing numbers of medical studies show takes a human toll.

The presumed ease of adjustment in terms of sleep patterns is a wrong presumption — even when we "fall back" in the autumn and "gain" an hour on the clock, according to a 2012 study in Sleep Medicine Re-

views, which cited increased rates of traffic accidents.

Heart attacks increased by 25 percent in hospitals

on the Monday immediately after the daylight saving time change in spring 2010-2013, according to a 2014 study of Michigan hospitals

by a University of Colorado Hospital cardiology fellow Dr. Amneet Sandhu.

However, Sandhu reported a 21 percent drop in heart

attack patient numbers the Monday after clocks were turned back an hour in the fall.

Sept. 5, 2013 at 3:00 AM

## Education secretary: Start school later in day

[http://www.upi.com/Top\\_News/US/2013/09/05/Education-secretary-Start-school-later-in-day/UPI-92611378364400/](http://www.upi.com/Top_News/US/2013/09/05/Education-secretary-Start-school-later-in-day/UPI-92611378364400/)

*Arne Duncan, U.S. Secretary of Education: Duncan started a debate on high school start times on Twitter Aug. 19, 2013. UPI/Kevin Dietsch*

WASHINGTON, Sept. 5 (UPI) -- Teenagers often tired in the morning could learn more in classrooms if local districts started the school day later, U.S. Education Secretary Arne Duncan said.

"There's lots of research and common sense that a lot of teens struggle to get up at 6 in the morning to get on the bus or 5:30 in the morning to get on the bus," Duncan told National Public Radio's "The Diane Rehm Show."

He said he understood school-bus logistics -- not only to school but also to after-school sports -- were a key force in starting high school days around dawn and ending them in mid-afternoon.

"But at the end of the day, I think it's incumbent upon education leaders to not run school systems that work good for buses but that don't work for students," said Duncan, who ran the Chicago Public Schools, the nation's third-largest school district with more than 400,000 students, before joining the Obama administration.

Duncan started a debate on high school start times on Twitter Aug. 19 when he wrote, "Common sense to improve student achievement that too few have implemented: let teens sleep more, start school later."

He told the program he meant "to challenge the status quo and be provocative" with his Twitter message.

"Study after study has shown mornings are very difficult [for teenagers]," Duncan told the program. "They're not very awake -- they're groggy, they're not able to pay attention in class," he said.

Starting later would increase teens' chances of being focused and concentrating so they can get more out of their school day, he said.

"So often in education, we design school systems that work for adults and not for kids," he said, citing current high school hours as "another example of that."

Duncan said Washington would not mandate a later start time. That decision would be left to the nation's 15,000 school districts, he said.

But he encouraged districts to challenge the existing state of affairs and consider a later start time.

"The vast majority of districts are just sort of conforming to the status quo, rather than being creative and innovative," he said.

"I would love to see more districts contemplating a later start time," he said.

At least 27 school districts have started schools later and have shown substantial successes, including increased student attendance, decreased student lateness and better grades, the Start School Later advocacy group said.

"The portion of students reporting at least 8 hours of sleep on school nights jumped from about 16 percent to almost 55 percent," St. George's School in Middletown, R.I., reported.

"Reports of daytime sleepiness dropped substantially, from 49 percent to 20 percent; first-period tardiness dropped by almost half, and students reported having more time to eat a hot, more nutritious breakfast," the school said.

Teen driver crash rates fell 16.5 percent in two years, Fayette County Public Schools in Lexington, Ky., reported, adding the rest of the state saw an increase in teen crash rates.

Many districts also reported saving sizable amounts of money, said Start School Later, which seeks to make school hours "compatible with health, safety, equity and learning."

Read more: [http://www.upi.com/Top\\_News/US/2013/09/05/Education-secretary-Start-school-later-in-day/UPI-92611378364400/#ixzz3E3z4Ag9A](http://www.upi.com/Top_News/US/2013/09/05/Education-secretary-Start-school-later-in-day/UPI-92611378364400/#ixzz3E3z4Ag9A)

January 15, 2014

## Later school start times improve sleep and daytime functioning in adolescents

**Date:**

January 15, 2014

**Source:**

Lifespan

**Summary:**

A psychologist and sleep expert recently led a study linking later school start times to improved sleep and mood in teens.



A new study links later school start times to improved sleep and mood in teens.

Julie Boergers, Ph.D., a psychologist and sleep expert from the Bradley Hasbro Children's Research Center, recently led a study linking later school start times to improved sleep and mood in teens.

The article, titled "Later School Start Time is Associated with Improved Sleep and Daytime Functioning in Adolescents," appears in the current issue of the *Journal of Developmental & Behavioral Pediatrics*.

"Sleep deprivation is epidemic among adolescents, with potentially serious impacts on mental and physical health, safety and learning. Early high school start times contribute to this problem," said Boergers. "Most teenagers undergo a biological shift to a later sleep-wake cycle, which can make early school start times particularly challenging. In this study, we looked at whether a relatively modest, temporary delay in school start time would change students' sleep patterns, sleepiness, mood and caffeine use."

Boergers' team administered the School Sleep Habits Survey to boarding students attending an independent high school both before and after their school start time was experimentally delayed from 8 to 8:25 a.m. during the winter term.

The delay in school start time was associated with a significant (29 minute) increase in sleep duration on school nights, with the percentage of students receiving eight or more hours of sleep on a school night jumping from 18 to 44 percent. The research found that younger students and those sleeping less at the start of the study were most likely to benefit from the schedule change. And once the earlier start time was reinstated during the spring term, teens reverted back to their original sleep levels.

Daytime sleepiness, depressed mood and caffeine use were all significantly reduced after the delay in school start time. The later school start time had no effect on the number of hours students spent doing homework, playing sports or engaging in extracurricular activities.

Boergers, who is also co-director of the Pediatric Sleep Disorders Clinic at Hasbro Children's Hospital, said that these findings have important implications for public policy. "The results of this study add to a growing body of research demonstrating important health benefits of later school start times for adolescents," she said. "If we more closely align school schedules with adolescents' circadian rhythms and sleep needs, we will have students who are more alert, happier, better prepared to learn, and aren't dependent on caffeine and energy drinks just to stay awake in class."



health, safety and equity in education

## PRESS STATEMENT

by

Terra Ziporyn Snider, PhD, Executive Director, Co-Founder  
Start School Later, Inc

For Immediate Release  
August 6, 2015

For more information, please contact:  
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### **Non-profit Start School Later Lauds CDC's Attention to Unhealthy School Start Times**

The national non-profit Start School Later lauds the Center for Disease Control and Prevention's (CDC's) attention to unhealthy school start times, highlighted in today's Morbidity and Mortality Weekly Report. We are delighted to see that the CDC is shedding light on this issue, which we consider a matter of public health that has been treated too long as a negotiable school budget item.

Health professionals have long considered sleep to be a public health issue given the links between chronic insufficient sleep and immune system dysfunction, more aggressive forms of cancer, diabetes, substance abuse, depression, car crashes, sports injuries, and more.

Experts have also long recognized early school start times as a primary contributor to adolescent sleep loss due to a later shift in sleep cycle and changes to the sleep drive that occur during puberty. In 2014 the American Academy of Pediatrics released a position statement calling for middle and high school start times after 8:30 a.m., followed by a similar consensus statement by the National Association of School Nurses and the Society of Pediatric Nurses.

Unfortunately, as noted by the CDC's report, more than 4 out of 5 middle and high schools in the US start their day before 8:30 a.m. Our greatest natural resource is our youth, and we encourage all superintendents, school board members, and state and federal lawmakers to act now to ensure school start times that protect child health, education, and safety.

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*Start School Later is a 501(c)(3) nonprofit organization working to ensure school start times compatible with health, safety, education, and equity. Please visit our website at: <http://www.startschoolater.net>.*

**Centers for Disease Control and Prevention: Morbidity and Mortality Weekly Report (MMWR)**

**School Start Times for Middle School and High School Students** (excerpts)

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Adolescents who do not get enough sleep are more likely to be overweight (1); not engage in daily physical activity (2); suffer from depressive symptoms (2); engage in unhealthy risk behaviors such as drinking, smoking tobacco, and using illicit drugs (2); and perform poorly in school (3). However, insufficient sleep is common among high school students, with less than one third of U.S. high school students sleeping at least 8 hours on school nights (4). In a policy statement published in 2014, the American Academy of Pediatrics (AAP) urged middle and high schools to modify start times as a means to enable students to get adequate sleep and improve their health, safety, academic performance, and quality of life (5). AAP recommended that "middle and high schools should aim for a starting time of no earlier than 8:30 a.m." (5). ... In view of these negative outcomes, the high prevalence of insufficient sleep among high school students is of substantial public health concern....

Groups seeking to delay school start times in their district often face resistance. Common barriers to delaying school start times include concerns about increased transportation costs because of changes in bus schedules; potential for traffic congestion for students and faculty; difficulty in scheduling after-school activities, especially athletic programs; and lack of education in some communities about the importance of sleep and school start times.¶ Advocates for delayed start times might benefit from 1) becoming familiar with research about the negative impact of insufficient sleep and early start times on adolescents' health, well-being, and academic performance; 2) identification of persons who might be impacted by the decision to delay start times, including parties involved in transportation and school athletic programs, as well as students, teachers, and school staff; and 3) preparing responses to common arguments against delaying start times. Many school systems have successfully overcome barriers to delay start times.\*\* ....

Among the possible public health interventions for increasing sufficient sleep among adolescents, delaying school start times has the potential for the greatest population impact by changing the environmental context for students in entire school districts! ...

**Summary**

What is already known on this topic? The American Academy of Pediatrics (AAP) has urged middle and high schools to modify school start times to enable adolescent students to get sufficient sleep and improve their health, safety, academic performance, and quality of life. AAP recommends that schools aim to start no earlier than 8:30 a.m.

What are the implications for public health practice? School start time policies are established at the district and individual school levels. Educating parents and school system decision-makers about the impact of sleep deprivation on adolescent health and academic performance might lead to adoption of later start times.



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## References

1. Lowry R, Eaton DK, Foti K, McKnight-Eily L, Perry G, Galuska DA. Association of sleep duration with obesity among US high school students. *J Obes* 2012;2012:476914.
2. McKnight-Eily LR, Eaton DK, Lowry R, Croft JB, Presley-Cantrell L, Perry GS. Relationships between hours of sleep and health-risk behaviors in US adolescent students. *Prev Med* 2011;53:271–3.
3. Perez-Lloret S, Videla AJ, Richaudeau A, et al. A multi-step pathway connecting short sleep duration to daytime somnolence, reduced attention, and poor academic performance: an exploratory cross-sectional study in teenagers. *J Clin Sleep Med* 2013;9:469–73.
4. Basch CE, Basch CH, Ruggles KV, Rajan S. Prevalence of sleep duration on an average school night among 4 nationally representative successive samples of American high school students, 2007–2013. *Prev Chronic Dis* 2014;11:E216.
5. Adolescent Sleep Working Group; Committee on Adolescence; Council on School Health. School start times for adolescents. *Pediatrics* 2014;134:642–9.
6. Hirshkowitz M, Whiton K, Albert SM, et al. National Sleep Foundation's sleep time duration recommendations: methodology and results summary. *Sleep Health* 2015;1:40–3.
7. Crowley SJ, Acebo C, Carskadon MA. Sleep, circadian rhythms, and delayed phase in adolescence. *Sleep Med* 2007;8:602–12.
8. Bartel KA, Gradisar M, Williamson P. Protective and risk factors for adolescent sleep: a meta-analytic review. *Sleep Med Rev* 2014;21:72–85.
9. Knutson KL, Lauderdale DS. Sociodemographic and behavioral predictors of bed time and wake time among US adolescents aged 15 to 17 years. *J Pediatr* 2009;154:426–30, 30 e1.
10. Fuligni AJ, Tsai KM, Krull JL, Gonzales NA. Daily concordance between parent and adolescent sleep habits. *J Adolesc Health* 2015;56:244–50.

† Additional information available at <http://nces.ed.gov/surveys/sass/overview.asp> and [http://nces.ed.gov/statprog/handbook/sass\\_surveydesign.asp](http://nces.ed.gov/statprog/handbook/sass_surveydesign.asp). Questions about SASS can be directed to Chelsea Owens at [chelsea.owens@ed.gov](mailto:chelsea.owens@ed.gov).

§ Information on *Healthy People 2020* sleep objectives is available at <http://www.healthypeople.gov/2020/topics-objectives/topic/sleep-health>.

¶ A discussion of common barriers faced by proponents of delayed school start times is available at <http://sleepfoundation.org/sleep-news/eight-major-obstacles-delaying-school-start-times>.

\*\* Several case studies that describe how this was done were compiled by the National Sleep Foundation and are available at <http://www.startschoollater.net/case-studies.html>.

†† Information on healthy sleep habits, often referred to as good "sleep hygiene", is available at <http://sleepfoundation.org/sleep-tools-tips/healthy-sleep-tips>.