



Research Brief

Impact of Starting Time on High School Students

Question: What are the effects of a later start time for high school students?

In a Nutshell

“Adolescent sleep deprivation is largely driven by a conflict between teens’ internal biological clocks and the schedules and demands of society. Therefore, it makes sense to look at school start times, which set the rhythm of the day for students, parents, teachers and members of the community at large.” (National Sleep Foundation, Backgrounder: Later school start times).

Several benefits of later school start times appear in the research. They include improved attendance, fewer tardies, a slight improvement in grades, fewer requests for help on academics, fewer disciplinary referrals, fewer peer relations issues and calmer hallways and cafeterias. Research also found that later start times did not reduce participation in extra-curricular activities.

Summary of Findings:

Sleep deprivation is a hot topic. According to the National Sleep Foundation, 50-70% of Americans are affected by some sort of sleep disorder (Sleep studies). High school students represent a high percentage of those lacking sleep. The research recommends that high school students get between 8 ½ to 9 ¼ hours of sleep each night. Physiologically, high school adolescents get melatonin secretions later in the day, which is why they seem to “wake up” about 10 pm and although they may be physically tired, their bodies will not allow them to fall asleep much before 11 pm. When forced to wake up early, their body thinks it is still the middle of the night. So it becomes difficult for them to wake up in the morning (National Sleep Foundation, Backgrounder: Later school start times). The lack of sleep is a problem that American adolescents share with adolescents in South America, Asia, Australia and Europe where research has confirmed similar results.

According to the research on later start times, it was reported that: attendance improved, continuous enrollment increased, there were fewer tardies, there were fewer visits to the school nurse, more students ate breakfast regularly, students reported gaining an hour of sleep, more homework was done during school hours, less students requested help on academics, grades improved slightly, the hallways and cafeteria were calmer, there were fewer discipline referrals, there were fewer peer relations issues, and extracurricular activities remained at the same levels (National Sleep Foundation, Backgrounder: Later school start times).

Sleeping and Adolescents

In an extensive national poll done by the National Sleep Institute, adolescents go from getting an average of 8.4 hours of sleep a night in sixth grade to 6.9 hours a night by twelfth grade. According to this same study, 45% don’t get enough sleep on school nights, while 31% get a borderline amount (eight to nine hours) and only 20% get the optimal amount. It was reported that at least half of the respondents go to bed after 11 pm on school nights and reported that they felt tired during the day and/or had difficulty getting to sleep. As a result, 31% had problems staying awake in school, 19% fell asleep in school or while studying and 11% were either late to school or missed it entirely due to lack of sleep (2006). A school day for a typical high school student frequently begins around 6 – 6:15 am after getting seven hours of sleep. Classes often begin around 7:15 to 7:30 and the student attends classes until 2 – 2:30 pm. After their school day ends, they spend the rest of their time working a part-time job, participating in a sport and/or club, studying and doing homework. If it has been a particularly good day, they may be in bed by 10:30 pm and hopefully asleep by 11 pm (it takes an adolescent approximately 25 minutes to fall asleep).



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Armed with this information, what is a reasonable time to begin school? Based on the research, between 8 – 8:30 am seems to be the optimum starting time for high school students (National Sleep Foundation, School start times and sleep).

Effects of lack of sleep

Research has identified several lifestyle issues associated with the lack of sleep. They include:

- Chronic health problems such as insomnia.
More than 50% in the NSF study reported they felt tired all day and/or had trouble falling asleep and got to bed after 11 pm on school nights.
- Weight gain, lack of energy to exercise.
32% of students in the NSF study stated they were too tired to exercise.
- Poor eating habits and nutrition, along with an increase of eating and drinking food that is heavily caffeinated and using products with nicotine.
75% of students in the NSF study said they drink caffeine every day.
- More prone to pimples and other skin issues.
- Depression, moodiness, hard to get along with others, aggressiveness, anxiety.
According to some schools that have gone to late start times, they report that office referrals have definitely declined.
- Drowsiness while driving.
According to the NSF study, 62% of 11th graders and 68% of 12th graders reported driving drowsy. 3% of 11th graders and 9% of the 12th graders said they had fallen asleep while driving. One study reported that in Virginia there was a 40% higher crash rate with students from a school where there was an early start time than in a neighboring district with a late start time, where the crash rates dropped by 16%.
- More illnesses such as colds and flu because the immune system is run down.
- Falling asleep in class.
19% of students in the NSF study reported that they fell asleep in class or while studying.
- More likely to be tardy or miss classes/school.
11% of respondents in the NSF study stated they had been late to class or missed school entirely.
(Adam, E. K.; Snell, Emily K.; Pendry, P., 2007; National Sleep Foundation, 2006; Parks, 2010; National Sleep Foundation, Sleep and teens; Sohn, E. , 2010).

Concerns and possible solutions

When adjusting the start of the high school day several concerns emerge. Because many schools have already dealt with these issues there are potential remedies for each concern.

- **Students will go to bed later:** If students do not have to be at school until 8:30 am, they will stay up later and still not get enough sleep.
Remedy: Research reports that students tend to go to bed 11 minutes earlier and sleep 45 minutes more when there is a later start time; educate students, their parents and staff on strategies for getting a good night's sleep.
- **Participation in athletics:** There is less time for daylight practice. Students may have to get out of class early for games with other schools not on a later start time.
Remedy: Lights can be installed on the playing fields, then practice can go later; the athletes' last class of the day can be their sport, that way they will not need to get out of classes very often. Schools that have changed to a later start time have solved these issues in these ways and report few, if any, problems.
- **After school activities:** There might be less time for students to participate.
Remedy: If students get more sleep and as a result can get their homework done more easily because they are



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not exhausted, they can more easily participate in additional activities.

- **Jobs:** Students that have jobs may not be able to work or not even be considered for a position because of getting out of school later.
Remedy: Businesses have reported that usually they do not need the extra help until school is over and often these jobs do not begin until 4:00-4:30.
- **Community resources:** Students may have less time to use them.
Remedy: If students can get their studying done efficiently because they have had enough sleep, they should have the time to access the community resources.
- **Supervision of younger children:** They may be unsupervised for an hour or more because high school students may not be available to watch them.
Remedy: Elementary schools can run afterschool programs; child-care programs can be established.
- **Teachers' time:** They may have less time to be with their own families.
Remedy: It has been reported that teachers often come to school early and get their planning and preparation done prior to the students arriving and leave shortly after the end of the school day.
- **Students' attention span:** It is a common belief that students are more alert in the morning.
Remedy: If students have gotten more sleep, then they will be more alert. They are seldom alert or able to concentrate and/or solve problems especially in the early morning, when they have only had seven to seven and a half hours of sleep.
- **School transportation:** Depending on when elementary and middle schools start, it could require revising the transportation schedule for all students in the district.
Remedy: Because younger children are more alert earlier in the morning, school districts have swapped start times with elementary schools and met with success; some districts pay for public transportation passes for their high school students.
(National Sleep Foundation, Eight major obstacles to delaying school start times; National Sleep Foundation, School start times and sleep; Spinks, S.)

Considerations prior to implementation

When considering a change to school start times there are several things to be done prior to implementation.

- Contact and network with schools (see attached list) that are on later start times.
- Contact schools in your athletic league to discuss game start times.
- Educate the students, parents, staff and community on benefits of a late start time.
- Provide ample education for students, parents and staff on appropriate conditions to get a good night's sleep
- Discuss start times within the district. It may require swapping start times with elementary and/or middle schools.
- Identify and utilize resources.
- Monitor and evaluate the program, in particular look at first hour absences and tardies, attendance patterns and grades.
- Communicate regularly with all stakeholders.
- Monitor, assess and revise as necessary.

(National Sleep Foundation, 2006; National Sleep Foundation, Backgrounder: Later school start times; National Sleep Foundation, General advocacy tips for changing school start times; Spinks, S.)

Summary

According to Mary A. Carskadon, PhD, Director of E.P. Bradley Hospital Research Laboratory and professor in Department of Psychiatry and Human Behavior at Brown University School of Medicine, "Given that the primary focus of education is to maximize human potential, then a new task before us is to ensure that the conditions in



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which learning takes place address the very biology of our learners" (National Sleep Foundation, Backgrounder: Later school start times).

Online Resources:

- Adam, E. K.; Snell, Emily K.; Pendry, P. (2007, March). Sleep timing and quantity in ecological and family context: A nationally representative time-diary study. Retrieved online
<http://psycnet.apa.org/index.cfm?fa=buy.optionToBuy&id=2007-03149-002>
This abstract reports the results of 2,454 children and adolescents and their reported sleep time.
- National Sleep Foundation. (n.d.). Backgrounder: Later school start times. Retrieved online
<http://www.sleepfoundation.org/article/hot-topics/backgrounder-later-school-start-times>
A comprehensive description of what to consider when changing start times and reasons why it makes sense to do so.
- National Sleep Foundation. (n.d.). Eight major obstacles to delaying school start times. Retrieved online
<http://www.sleepfoundation.org/article/hot-topics/eight-major-obstacles-delaying-school-start-times>
This piece lists potential obstacles to a later start time, however, it provides some potential answers to those impediments.
- National Sleep Foundation. (2006, January). For teens, advice on how to get more sleep. Retrieved online
<http://www.washingtonpost.com/wp-dyn/content/article/2006/01/25/AR2006012500857.html>
A succinct article that appeared in the Washington Post listing strategies to help adolescents get more and better quality sleep.
- National Sleep Foundation. (n.d.) General advocacy tips for changing school start times. Retrieved online
<http://www.sleepfoundation.org/article/hot-topics/general-advocacy-tips-changing-school-start-times>
A short, yet comprehensive piece on critical considerations when changing the start time is provided.
- National Sleep Foundation. (n.d.). School start times and sleep. Retrieved online
<http://www.sleepfoundation.org/article/sleep-topics/school-start-time-and-sleep>
Reasons for the start time in high schools to begin at 8:30 or later are provided in this article.
- National Sleep Foundation. (2006). Sleep and teens. Retrieved online
http://www.sleepfoundation.org/sites/default/files/2006_summary_of_findings.pdf
The results of a poll done with adolescents about their sleep patterns and habits are fully reported in this well-documented study.
- National Sleep Foundation. (n.d.). Sleep studies. Retrieved online
<http://www.sleepfoundation.org/article/sleep-topics/sleep-studies>
This piece is an informative overview of the types of sleep studies available and ways to get a better night's rest.
- National Sleep Foundation. (n.d.). Teens and sleep. Retrieved online
<http://www.sleepfoundation.org/article/sleep-topics/teens-and-sleep>
A comprehensive article on the reasons why adolescents need to get 8.5-9.5 hours of sleep daily.



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- Parks, A. (2010, July 19). "Early starts can put teens behind." Retrieved online
<http://www.time.com/time/magazine/article/0,9171,2002531,00.html>
This article from TIME magazine describes reasons why early start times can be detrimental to teens and supports the information with results of research.
- Sohn, E. (2010, June 9). Teen car accidents linked to early start time. Retrieved online
<http://news.discovery.com/human/teens-school-start-times.html>
An article that describes some research done that indicates there are fewer car accidents of adolescent drivers when they go to schools with later start times.
- Spinks, S. (n.d.) Adolescents and sleep. Retrieved online
<http://www.pbs.org/wgbh/pages/frontline/shows/teenbrain/from/sleep.html>
This article provides information on research done on late start times and provides a list of things that can be done to help ensure a good night's sleep.
- Start Later for Excellence in Education Proposal (SLEEP). (n.d.). Retrieved online
<http://www.sleepin Fairfax.org/>
A comprehensive website with a myriad of references on the importance of adolescents getting sleep and support for later start times.

Examples of Schools with Later Start Times

- Deep Creek High School, Chesapeake, Virginia
<http://www.cpschools.com/Schools/DCHS/dch.html>
- Edina High School, Edina, Minnesota
<http://www.edina.k12.mn.us/news/reports/latstart/index.html>
This portion of their web site describes why they went to late start times and results of the schedule.
- Edison High School, Minneapolis, Minnesota
http://edison.mpls.k12.mn.us/Bell_Schedule.html
- Fayette County Schools, Lexington, Kentucky
<http://www.fcps.net/schools/high>
The schedules for each high school can be obtained from this site. All high schools in the district begin at 8:25.
- Grassfield High School, Chesapeake, Virginia
<http://www.cpschools.com/Schools/GFH/index.htm>
- Hickory High School, Chesapeake, Virginia
<http://www.cpschools.com/Schools/HHS/4x4.html>
- Nathan Hale High School, Seattle, Washington
<http://www.seattleschools.org/schools/hale/>
- Thomas Jefferson HSST. Alexandria, Virginia
<http://www.tjhsst.edu/abouttj/bell.php>



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- Washington-Lee High School, Arlington, Virginia
<http://www.apsva.us/washingtonlee/site/default.asp>
- Wilton High School, Wilton, Connecticut
<http://www.wilton.k12.ct.us/whs/cal/bellschedules.pdf>

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