Educate • Empower • Achieve

Later Start Times for High Schoolers: Benefits, Challenges and Creative Solutions

By Jennifer Bashant, Ph.D. and Terry Barlow, Ed.D.

Introduction

There is over 25 years of research and ample evidence demonstrating that starting school later in the day for high schoolers (and middle schoolers) has the potential to substantially improve school performance (Hamilton Project, 2011), yet most high schools are still starting first period before 8:00 a.m. Although most school administrators have some familiarity with the medical research that outlines a shift in adolescents' sleep/wake cycle and the educational research that demonstrates the benefits of a later start time, there are complications that arise when schools move to a later start time. Shifting to a later high school start time is complex because of many interrelated factors such as transportation, family schedules, childcare and athletics. However, an effective change process begins with an in-depth understanding of the identified problem, local data regarding the impact of the problem, and research and best practice regarding how other districts have successfully navigated such a change in policy. This paper will define the full extent of the problem; provide a thorough review of the negative impact of sleep deprivation on the developing minds and bodies of adolescents; discuss positive outcomes of a later start; barriers that must be addressed and creative solutions other schools have effectively implemented; and highlight local schools who have made a change and their experiences.

During adolescence, bedtime shifts to later in the evening as a result of biological maturation and an increase in academic workload, athletics and social activities. Despite a later bedtime, adolescents often must wake up even earlier than they did during childhood due to early school start times, which very often results in sleep deprivation (Hasler & Clark, 2013). Research demonstrates that younger people require more sleep than adults. The usual recommendation for preschool children is 11 to 12 hours. School-age children require 10 hours and teenagers need 8.5 to 9.5 hours per night (Carroll, 2016). According to the National Sleep Foundation, only 14% of adolescents get the recommended number of hours of sleep per night. Approximately 70% of adolescents get less than eight hours of sleep on a typical weeknight (Boergers, 2015). This is a very concerning statistic given the wide range of negative consequences of sleep deprivation, especially during adolescence.

The Science of Circadian Rhythms

Human sleep and wake phases are matched to the dark and light periods of each day. Sleep-wake timing is influenced primarily by circadian rhythms, but is also impacted by scheduling influences including the start of the school day (Hasler & Clark, 2013). Research highlights the relative importance of circadian

rhythms (this is the most influential aspect of sleep) to adolescent functioning (Short, Gradisar, Lack & Wright, 2013). During this stage of development, adolescents appear to become resistant to the homeostatic sleep drive that accumulates with time spent awake (Hasler & Clark, 2013). It is clearly a matter of biology, not choice, that teenagers are unable to fall asleep before about 10:45 p.m. and that their brains remain in sleep mode until about 8 a.m. This delay in circadian rhythms is directly related to hormonal changes during puberty (Wahlstrom, 2017).

Similar studies conducted in other countries, such as Italy, Brazil and Israel, report findings consistent with those from the United States. The sleep phase shift that occurs in teenagers' neurological systems is not culturally based; it is a phenomenon of human development (Wahlstrom, 2003).

The effect that circadian rhythm has on sleep quality is likely to result from adolescents trying to initiate and maintain sleep according to socially conventional sleep/wake times (in order to rise for school) rather than their own biologically driven sleep/wake pattern (Short et al, 2013). Circadian misalignment, defined as "a mismatch between the sleep/wake schedule and the internal circadian timing," is most often thought of as being caused by night shift work or jet lag, but it also occurs when school schedules are mismatched with students' circadian timing (Hasler & Clark, 2013). Because teens need to get up at a fixed time for school, sleep may be truncated (Short et al, 2013).

Defining the problem

High school students often start earlier in the day so that the same buses can be used to transport elementary students. Older students are transported first so younger students do not have to walk to school or wait for the bus when it may be dark. In addition, early start times are believed to be advantageous for high schoolers who may have activities or work after school (Hamilton Project, 2011). Early school start times conflict with adolescents' night owl tendencies, leading to circadian misalignment, sleep disturbance, and sleep loss on weekdays. As a result, teens typically try to make up for lost sleep by sleeping much later on the weekends. However, this only further disrupts the circadian rhythm. This phenomenon of "weekend delays" typically increases in older adolescents (Hasler & Clark, 2013).

The impact of a later school start time only becomes significant around age 13, and increases through the rest of high school (Edwards, 2012). Sleep timing continues to delay until around the age of 20, when it stops delaying and begins to advance (Hasler & Clark, 2013). Therefore, there would be no disruption to the sleep/wake cycle of elementary students by assigning them the earliest start time.

Negative Consequences of Sleep Deprivation for Adolescents

ACADEMIC COMPLICATIONS

Attempting to sleep or be active at times incompatible with the circadian clock may have direct effects on adolescents' cognitive processes, physical health and mental health (Hasler & Clark, 2013). Not getting enough sleep often leads to cognitive impairments such as difficulty focusing and learning new academic material, impaired memory and decreased daytime alertness (Wahlstrom, 2003). Without adequate sleep, teenagers are "losing the ability not only to solidify information but to transform and restructure it, extracting inferences and insights into problems," according to a sleep researcher and

assistant professor of psychology at the University of Notre Dame (Hoffman, 2013). This is precisely the higher order thinking we are striving to help our students achieve.

INCREASE IN HIGH-RISK BEHAVIORS

Research shows a correlation between sleep and high-risk behaviors. Adolescents getting fewer than eight hours of sleep during the week are more likely to engage in high-risk behaviors such as smoking, drinking alcohol, using drugs and engaging in sexual activity (Center for Research, Regional Education and Outreach, 2014). The consequences of insufficient sleep may include a negative impact on the control of behavior, emotions and attention, which can be associated with high-risk behaviors (McKnight-Eily, Eaton, Lowry, Croft, Presley-Cantrell & Perry, 2011).

IMPACT ON MOOD

The Journal of Adolescence published a study of 15,000 adolescents which found that later bedtimes were related to a higher risk of depression and suicidal ideation (Hasler & Clark, 2013). Researchers have also identified a relationship between adolescents' sleep and their own awareness of their emotional state, mood, and their ability to regulate and control their emotions (Center for Research, Regional Education and Outreach, 2014). These teens report being less alert, less efficient, more helpless, more forgetful and exhausted. They also reported increased feelings of tension, anger and anxiety. They had more feelings of being on-edge, nervous and restless when sleep-restricted (Baum, Desai, Field, Miller, Rausch & Beebe, 2014). These symptoms are also corroborated by parent reports (Center for Research, Regional Education and Outreach, 2014).

POORER PHYSICAL HEALTH

Incidence of obesity are higher among adolescents who get insufficient sleep. "For each hour of lost sleep, the odds of obesity increased by 80%" (Center for Research, Regional Education and Outreach, 2014). In one study, athletes who got fewer than eight hours of sleep during the week were 1.7 times more likely to suffer an injury than those who got more than eight hours of sleep. Research literature also documents extensive negative physical consequences of sleep deprivation, including gastro-intestinal disturbance and adverse cardiovascular and metabolic effects, namely obesity (Hasler & Clark, 2013).

INCREASE IN RISK OF CAR ACCIDENTS

Car accidents are the greatest cause of accident death in teens. According to the National Highway Traffic Safety Administration, more than 2,700 teens are killed in car crashes every year. During 2006, a teen died in a traffic crash an average of once every hour on weekends and nearly once every two hours during the week (Wahlstrom, 2017). A person who is sleep-deprived has reduced reaction times, slower eye movements, and decreased ability to make quick decisions. Sleep deprived teen drivers present a significant danger to both themselves and fellow motorists.

In a study of driving records of 17-24 year olds, young people who reported the least sleep were 21% more likely to have been involved in a car accident than those who reported the most sleep (Center for Research, Regional Education and Outreach, 2014). According to another study, the risk intensifies when insufficient sleep and substance abuse are combined. Together, they had a synergistic influence on

cognitive abilities (concentration, vigilance, alertness) and coordination, leading to an even higher risk of accidents (McKnight-Eily et al, 2011).

Positive Outcomes

In addition to describing the negative consequences of sleep deprivation for teens, many studies exist that have documented the positive effects when schools move to a later start time. Clear statistical evidence exists to demonstrate that when teens do get the recommended eight or more hours of sleep during the week, they report higher grades, less depression and fewer at-risk behaviors for dropping out of school (Wahlstrom, 2003). A large, CDC-funded study published in 2014 examined 9,000 students in eight public schools across three states. Researchers found that in high schools where classes began at 7:30 a.m., only one third of children got at least eight hours of sleep per night. If they started at 8:35 p.m., about 60% of teens achieved that goal (Carroll, 2016). The advantages of an adequate amount of sleep are numerous and range from academic benefits, to mental health benefits and safety. Schools should find ways to measure the many important areas of impact, such as student physical and emotional well-being, benefits associated with teaching and learning, and improved family relationships (Wahlstrom, 2003).

BETTER ACADEMIC PERFORMANCE

Research indicates that students who get more sleep have higher grade point averages in core classes, higher grades in general, and generally higher test scores (Center for Research, Regional Education and Outreach, 2014). The most scientifically sound evidence comes from a random assignment study among first-year Air Force cadets. The random assignment to experimental conditions allowed the researchers to control for differences among individuals, and therefore generalize the findings to a wider range of people. Researchers found that the cadets assigned to class start times before 8 a.m. performed substantially worse in those early classes and in all of their subsequent courses. In other words, a lack of adequate sleep continued to affect the students throughout their entire day. Other research suggests that students who sleep later usually spend more time doing homework and less time watching television (Hamilton Project, 2011). This is important, as it addresses a common concern of parents – that if school start time is pushed back, teens' bedtimes will just get later. This does not appear to be the case.

IMPROVED BEHAVIOR

Analysis of the national Youth Risk Behavior Survey revealed that eight or more hours of sleep seems to be the tipping point for reducing at-risk behaviors of teenagers. Cigarette, alcohol and marijuana use declined by 8% to 14% when teens slept eight or more hours per night, with depression and sexual activity declining from 9% to 11% (Wahlstrom, 2017). Among the over 9,000 students in the CDC-funded study, those who slept eight or more hours per night were also significantly less likely to: fall asleep in class, drink caffeinated beverages, have a phone or computer in their bedroom, and do dangerous things without thinking (11). With a later start time, students were reported to be more awake during

the first hour of classes, and the principals reported fewer disciplinary incidents in the halls and in the lunchroom (Wahlstrom, 2017). In summary, students are more awake and alert and better able to regulate their behavior.

REDUCED TARDINESS AND ABSENSES

Studies have found an increase in attendance, a decrease in lateness, and a decrease in excused absences in schools that have moved to later start times (Center for Research, Regional Education and Outreach, 2014). In one particular study that spanned across three states, the schools reported significant decreases in absences and tardiness for all grades 9-12 in the schools that implemented the latest start times (8:30 and 8:55 a.m.). In one district, there was a 68% drop in tardiness (Wahlstrom, 2017). If students are getting to school on time and seat time is increasing, it makes sense that these pupils would realize improved academic outcomes.

Impact on At-Risk Students. Addressing the needs of students who are at-risk learners, at risk for dropping out of school, or both is a concern in every school. In many cases, at-risk students do not have enough credits to graduate because they have missed too many first and second period classes. One study revealed that attendance rates improved significantly when the start time was pushed back. This suggests that changing start times is one way to recapture those students who may otherwise not finish high school (Wahlstrom, 2003). The impact of a later start time can be significant for all adolescents, but has the potential to be a "game changer" for at-risk students.

IMPROVED MOOD

Getting an adequate amount of sleep is hugely important for the rapidly developing adolescent brain. One of the most significant ways adequate sleep serves as a protective factor (lowers the risk) is with regard to mood. Students who are getting at least eight hours of sleep or more per night report fewer symptoms of depression and greater feelings of self-efficacy (Wahlstrom, 2017).

In another study of the impact of school start time on students' sleep habits and depressive mood, researchers surveyed students before and after a delay in start times was implemented. On average, students report getting more sleep and having fewer instances of depression than prior to the change in start time. This finding was corroborated by parent surveys, which found that 92% of parents reported that their teens are easier to live with as a result of the change in start time (Center for Research, Regional Education and Outreach, 2014). Not only is the later start time positively impacting the adolescents, but it is also having a positive effect on the entire family.

FEWER CAR ACCIDENTS

Many of the schools across the country who have moved to a later start time have data regarding car accidents involving high schoolers before and after the change. In one study of five school districts, the number of car crashes involving teens decreased by 13%. Reductions in accidents ranged from 6% to 70%, with the greatest decrease seen in the school with the latest start time (Wahlstrom, 2017). In Fayette County, KY, adolescent car crashes were reduced by more than 16% in the two years following a later high school start time. In Teton County, WY, the year after the start time was moved from 7:35

a.m. to 8:55 a.m., car accidents for 16-18 year olds were reduced by 70% (Center for Research, Regional Education and Outreach, 2014).

What Is The Optimal Start Time?

An interesting difference has been noted in the research between specific start times. In one study, when the researchers compared the outcomes of schools starting at 8:00 – 8:30 a.m. with those of the school with the later start time of 8:55 a.m., they found significant increases in 1st period grade point average in one or more core courses versus significant increases in ALL 1st period core courses for all semesters for the later start times. Many studies exist which show that the later the start time, the greater the academic benefit (Wahlstrom, 2017; Center for Research, Regional Education and Outreach, 2014). Whether schools implement a modest or significant change to the start time, they experience the same level of community disruption. Therefore, it is recommended that schools move the start time as late as possible.

Addressing Barriers and Concerns

If changing the start time in a school were easy, most schools would have made the change by now. Establishing later start times in a high school can be difficult and complicated due to many complex, interrelated factors. Districts that have considered implementing later high school start times have often encountered intense resistance from parents and other community members who assume their interests will be negatively affected. It is also commonly reported that superintendents and/or members of the school board fear the reaction of parents and the community if they were to adopt a later high school start time. They are often afraid that such a potentially polarizing event may lead to them being replaced in their roles (Wahlstrom, 2003). Research literature has documented the most common barriers and concerns of parents and community members. The following section highlights these barriers and concerns, and includes suggestions for addressing issues that have worked for other schools.

INTERRELATED DYNAMICS

As stated above, moving the start time of a high school produces a series of decisions that must be made and issues that must be resolved. Several factors come into play, including: the school board and their political relationship to the superintendent, the role of the principals and their involvement in the decision, the role of data for and against the change, and the voices and needs of teachers, students and families (Wahlstrom 2003). All of these factors must be anticipated and considered in the process of exploring a policy change.

PROCESS OF CHANGE

Districts that have already gone through this change process have been able to share which aspects of the process have proven helpful. Introducing a policy change to stakeholders without first impartially sharing and discussing the complete array of research supported findings will almost certainly lead to their disapproval of the idea. Change is unsettling to most people because it disrupts peoples' feelings of

stability and continuity (Wahlstrom, 2003), but resistance can be countered with the sharing of information and involvement in the process. When routines are upset, it is human nature to react negatively. It is of paramount importance to approach the change with that knowledge in mind and make every effort to provide stakeholders with data and time to discuss and address their issues/concerns.

ATHLETIC SCHEDULES

One of the major concerns of parents, students and coaches is that moving the start time back will negatively impact sports practices and games. Schools who have made this change have found ways around this problem so that sports are not negatively impacted. One idea is to incorporate an activity period into the school day so that the day does not end later, even though it starts later (Center for Research, Regional Education and Outreach, 2014). For example, in some schools, the last period of the day is a student-optional period during which some clubs operate and students may seek any necessary extra help. Sports practices typically begin after this activity period has ended. Another option is to schedule more games on the weekends (Center for Research, Regional Education and Outreach, 2014). Interestingly, the local school case studies (discussed later in this paper) reveal that sports practices and games were not affected at all by the change.

Since darkness may become an issues for outdoor practices during the late fall season, some schools have added lights on athletic fields (Hamilton Project, 2011). Other schools have added WiFi access to buses so athletes can do homework while on the road to games (Hoffman, 2014). Issues with conflicting sports schedules within your council could be addressed by making changes to later start times at a regional level so that all schools in the region would be on the same schedule (Hamilton Project, 2011). This is being done in Ulster County – contact information is included below so that they can serve as a resource.

PARTICIPATION IN SPORTS AND ACTIVITIES

According to the Brown University study, a later start time had no impact on the number of hours students spent playing sports, engaging in activities or doing homework. These students rated themselves as having more energy for doing homework (Boergers, 2015). In a study of over 9,000 students, researchers found no evidence that the later start time had a significant effect on the sports program or the success of competitive teams (Wahlstrom, 2017).

CHILDCARE FOR YOUNGER CHILDREN

Many schools have found creative solutions that have resolved the problem of childcare before and after school for younger children. Providing more options for fee-based care at the elementary schools in one option. Another way of addressing this issue is to partner with community organizations to provide care after school. Other schools have worked with community partners to provide extra-curricular activities for younger students (Center for Research, Regional Education and Outreach, 2014). The involvement of the parents and the community in this process is paramount (Wahlstrom, 2017).

LOCAL RUSH-HOUR TRAFFIC

This can present a problem for parents, so schools must be ready to listen to parents' concerns and work together to problem solve.

TRANSPORTATION COSTS

Transportation costs are often cited as the reason a change to a later start time has not been implemented. However, there are many examples of urban, suburban and rural districts that have made the change but did not increase cost (Wahlstrom, 2003). Creative solutions for student transportation are often the best way to address this problem. Some solutions that have worked for other schools are:

- Implement multiage busing (Wahlstrom, 2017).
- Move all start times within a district back so that all students go to school later.
- Move to a single bell schedule so all school start at the same time (although this may mean adding buses).
- Flip start times so elementary students go early and middle and high school go later.
- Move start time later but keep same end time.
- Provide flexible start and end times (Center for Research, Regional Education and Outreach, 2014).

LATER START TIMES MAY LEAD TO LATER BED TIMES

In a large study of more than 12,000 students in Minneapolis (Wahlstron, 2002), the findings indicate that students continue to get an hour more of sleep each school night four years into the change to a later start time. This is contrary to the fears and expectations that a later start time would result in students staying awake an hour later on school nights. Instead, students in Minneapolis high schools get five more hours of sleep per week than do their peers that start earlier in the day.

Consistent with the MN study, researchers at Brown University (2014) found that when the school start time was pushed back 25 minutes, the bedtimes of students stayed the same and students gained an additional 25 minutes of sleep per day (Boergers, 2015).

The Medical Field Takes a Stand

Researchers have been studying the impact of later school start times on adolescents since the 1990s, but schools have been very slow to respond to the compelling findings. From 2000 to 2010, more than 400 superintendents and principals reached out to leading researcher Dr. Kyla Wahlstrom at the University of Minnesota to ask questions and begin looking into later start times for their high schools. By 2005, approximately 250 high schools in the United States had made the shift to a later start time, according to data collected by the National Sleep Foundation (Wahlstrom, 2017).

As more and more evidence continues to be published in academic journals, The American Academy of Pediatrics (2014) and The American Medical Association (2016) both released position statements urging schools to move to later start times for middle and high school students. The statements are as follows:

The American Academy of Pediatrics (AAP)

"The American Academy of Pediatrics (AAP) recommends middle and high schools delay the start of class to 8:30 am or later. Doing so will align school schedules to the biological sleep rhythms of adolescents, whose sleep-wake cycles begin to shift up to two hours later at the start of puberty. The AAP urges middle and high schools to aim for later start times that allow students to receive 8.5 to 9.5 hours of sleep per night."

Source: https://www.aap.org/en-us/about-the-aap/aap-press-room/pages/let-them-sleep-aap-recommends-delaying-start-times-of-middle-and-high-schools-to-combat-teen-sleep-deprivation.aspx

The American Medical Association (AMA)

"Sleep deprivation is a growing public health issue affecting our nation's adolescents, putting them at risk for mental, physical and emotional distress and disorders. Scientific evidence strongly suggests that allowing adolescents more time for sleep at the appropriate hours results in improvements in health, academic performance, behavior and general well-being. We believe delaying school start times will help ensure middle and high school students get enough sleep, and that it will improve the overall mental and physical health of our nation's young people. While implementing a delayed school start time can be an emotional and potentially stressful issue for school districts, families, and members of the community, the health benefits for adolescents far outweigh any potentially negative consequences."

Source: https://www.ama-assn.org/ama-supports-delayed-school-start-times-improve-adolescent-wellness

Local Case Studies and Contact Information

Corinth (www.corinthcsd.org)
Contact Person: Brian Testani (High School Principal)
518-654-9005 x3430

Corinth Elementary School, Middle School, and High School moved their start time from 7.35 to 8:15 four years ago. Corinth uses a single bus run. The rationale for the decision was based upon the research on adolescent sleep needs. The superintendent made the decision to start school later and informed the BOE prior to the change. Some BOE members wanted to survey the community, however the superintendent maintained the change was an academic decision supported by research regarding what is best for students. The survey was not conducted.

Since the district used a separate bus run for AM/PM BOCES students, these students and their transportation were not affected by the shift in school start time. The BOCES bus runs remained unchanged. Corinth is involved with Distance Learning (DL) as both a sending and receiving school. The move to a later school start time aligned Corinth with other DL member schools. Prior to this shift, Corinth started earlier than other schools. Period one is now available to send and receive DL courses.

The community has largely supported the shift to a later school start time. Feedback from families reveal that mornings at home on school days are less hectic, with lower familial stress. Anecdotal evidence from teachers suggests that students are more alert during period one. Attendance data shows that tardiness has diminshed.

After school activities including athletics have not been adversely affected by the change of the school day ending time from 2:40 to 3:00. There are no plans to shift back to the earlier start times.

Coxsackie-Athens (www.cacsd.org)
Contact Person: Randall Squire (Superintendent)
518-731-1710

Three years ago the district moved their start times for the middle school and high school from 7:50 to 8:08. (The principal wanted an 8:30 start time.) Research on adolescent sleep needs that indicates early school start times are not aligned with optimal adolescent cognitive functioning was the driving force behind the district's decision. The district also shifted the elementary school start time back 20 minutes to accommodate a second bus run. There was some push back from parents of elementary students about the shift in starting time. The majority of concerns pertained to child care, commuting complications (e.g. more traffic, longer commuting time during the trip to jobs), and family logistics (e.g. bathroom use, breakfast preparation). Over time, families have adjusted and the objections have become non-issues.

There was some tension between the district and Questar III BOCES over first period attendance at Vo-Tech. The actual time lost by Coxsackie-Athens students was five minutes and ultimately did not present a significant issue. Coxsackie Athens participates in 22 periods of distance learning. The loss of first period availability for DL was the most significant consequence of the later start time. Dismissal time for the middle school and the high school moved from 2:25 to 2:34. Period 10, an enrichment/extra help/activity period, moved from 2:30- 3:00 to 2:39-3:09. Athletic practices now begin after 3:09. The tardy rate to school has improved slightly. Mr. Squire reported that there is no thought of changing back to an earlier start time.

Glens Falls (www.gfsd.org)
Contact Person: Paul Jenkins (Superintendent)
518-792-1212

Four years ago, the Glens Falls city schools moved back their school start times. Start times are now 8:25 for the middle school and high school and 8:20 for the elementary school. The high school day is 8:25 - 3:05. This change was initiated by teachers wanting to improve student achievement and graduation rates. The initial push was driven by chronobiology research indicating the correlation between adequate adolescent sleep and factors such as physical health, depression, risk-taking behavior, school tardiness and absence, and academic achievement.

Many clubs and student organizations at Glens Falls High School meet during period ten and thus were unaffected by the change in school start time. Coaches of athletic teams were told practices could not begin before the end of period ten. Glens Falls High School belongs to the Foothills Council. Foothills

athletic contests start at 4:00. Travel to away athletic contests was not an issue. The district kept the original morning BOCES bus schedule therefore BOCES students arrived at the BOCES campus on time.

Mr. Jenkins reported that since the shift in start time, students are more alert, tardiness has dropped and attendance rates have improved. The district is working with St. Lawrence University on a follow up study regarding the impacts of the later school start time. Dr. Pamela Thatcher, a clinical psychologist, and the project's lead researcher, has conducted annual surveys of students. Additional information about the surveys can be found in your handouts. Dr. Thatcher can be contacted at **pthacher@stlawu.edu.**

New Paltz (www.newpaltz.k12.ny.us)
Contact Person: Maria Rice (Superintendent)
845- 256 – 4360

Four years ago, the New Paltz School District moved the high school start time from 7:30 to 8:00. Superintendent Maria Rice stated the research was compelling. The board of education strongly agreed and supported the shift to a later start time. Around this same time, there was interest among all Ulster County school districts to explore starting school later. The rationale behind the initiative was to align later school times with the Ulster BOCES schedule. However, with each district being unique and having unique school community needs, agreeing on a uniform starting time was not feasible. New Paltz made the change unilaterally.

Today, there is interest in delaying the starting times for the elementary, middle, and high schools. (The high school start time would move to 8:30). Again, the science and research is the driving force. However, there are vocal groups for and against even later start times. The district worked with K-12 Insight to conduct focus groups from which survey questions were developed. The survey was mailed to homes and an online survey was disseminated. The survey window ran from November 29 to December 15, 2015.

A 60 page analysis and summary of the survey responses can be accessed at www.newpaltz.k12.ny.us. Find the **Quick Links** section and click on *School Start Time Initiative.*

Key Findings from the Survey Analysis

- The highest rated factors to consider when shifting to a later school start time at all instructional levels and by parents student and staff were students' health and wellness and academic performance.
- The current start times were selected with the most frequency by students, staff, and parents.
- School end times for the high school should not be later than 2:30.
- 71 of high school students said that a later school start time would have a positive impact on their sleep.
- Many staff do not live in-district. Any change in school start and ending times would be an inconvenience impacting child care and family life.

The district is exploring what changes might be taken to start the high school at 8:30 and end at 2:30. Presently, the high school master schedule has 84 minute teaching blocks. There are separate morning and afternoon BOCES runs which would not be changed. The district does not participate in distance learning. The challenge is to find enough time by shortening instructional blocks, passing times and lunch periods to conclude the school day by 2:30.

North East Clinton (nccscougars.org)
Contact Person: Jeffrey Morlock (Transportation Supervisor)
518- 298-8242

The N.E. Clinton School District moved the start time of the middle school and high school from 8:15 to 8:50. Although school officials were aware of adolescent sleep research, the change was motivated by primarily fiscal concerns. The change in start times allowed five bus runs to be eliminated. The district is geographically large, running along the Canadian border in Clinton County. It stretches from Mooers in the west to Rouses Point in the east. Bus travel times are long, in some instances over 1.5 hours. Prior to the change, all students were picked up and transported to one of three elementary schools. The elementary students were dropped off and middle and high school students went on to the secondary campus. Also two BOCES runs took students to VO-TECH in Plattsburgh. After the change, there are separate elementary and secondary bus runs with the two BOCES runs remaining unchanged.

The district experienced considerable community resistance to the change, primarily for logistical family reasons (e.g. morning child care). Prior to the later start time, the district estimated $300,000 savings in transportation costs. However, due to loss of state aid, the actual savings have averaged around $140,000.Neither athletics or after school activities were affected by the change. Mr. Morlock knows of no plan to modify the current school start time.

Rhinebeck (www.rhinebeckcsls.org)
Contact Person: Joseph Phelan (Superintendent)
845-871-5520

The Rhinebeck district is in its first year of a pilot program to shift the high school and middle school times from 7:30-2:16 to 8:00-2:35, and the elementary day from 8:55-3:30 to 9:00-3:35. The change was made in response to parent requests for later school start times. District buses do double runs: a middle school/high school run followed by an elementary run. Mr. Phelan reports no negative impact on the morning BOCES transportation. The district does not participate in distance learning. Athletic practices and after school activities start later but, as yet, no unfavorable feedback has surfaced.

Saratoga Springs (www.saratogaschools.org)
Contact Person: Janice White (Former Superintendent)
518-244-2490

Several years ago, the Saratoga Springs district considered a move to later school start times in response to parent requests to the Board of Education. School officials researched the connection of later school

start time to overall wellness of students, student academic performance, student attendance/tardiness and behavior and discipline concerns. Due to logistical obstacles, the district decided against a change.

Additional Contacts

Hope Pearlman

Chapter Leader - Capital District Start School Later

Send@SSLCapitalDistrictNY

Start School Later, Inc.

P.O. Box 6105

Annapolis, MD 21401

www.startschoollater.net

New York State School Boards Association

www.nyssba.org

Ashleigh Livingston - *Plattsburgh Press Republican*

(Re: N.E. Clinton and Plattsburgh City S.D. initiatives)

519-561-2300

The Center for Research, Regional Education and Outreach (CRREO)

SUNY New Paltz

www.newpaltz.edu/benjamincenter

Next Steps and Conclusion

The serious issue of sleep deprivation for adolescent students in this country coincides with a developmental period of rapid growth when psychopathology can emerge for the first time and remain for a lifetime. Adolescence is a time of insecurity, self-discovery and tremendous social and academic pressures during which even healthy adolescents show increased emotional reactivity. In the adolescent

brain, the prefrontal-subcortical circuits that regulate emotion are rapidly developing. Sleep researchers have hypothesized that continually not getting enough sleep can alter that development which could have lifelong consequences (Baum et al, 2014). The Brookings Institute (2011) conducted a cost/benefit analysis for schools and communities regarding the impact of a later school start time. They estimated that the cost to communities (transportation costs) was quite low in comparison to the short and long-term financial benefits to society (higher achievement scores translating into higher earning potential). They estimate a 9:1 benefit to cost ratio (Boergers, 2015).

Dr. Elizabeth Miller, chief of adolescent medicine at Children's Hospital of Pittsburgh, states that, "Even schools with limited resources can make this one policy change with what appears to be many benefits for their students" (Hoffman, 2014). Hundreds of schools across the U.S. have made a change, so many case studies exist and creative solutions can be borrowed and implemented. Schools and districts considering a change in start time must engage a wide array of stakeholders in the discussion. Some of the essentials players are administrators, teachers, parents, and students. Health care providers such as pediatricians, community activity directors such as parks and recreation leaders, and public safety officials should also be engaged in the dialog (Wahlstrom, 2017). The more information that is shared and discussed, the better informed the school and community will be and the more effective and creative solutions will be generated and implemented.

There are a handful of schools in the Capital District who have moved to later start times. CASDA has been conducting phone interviews to learn more about the obstacles they have faced and how they have overcome them. CASDA is also compiling any data these schools have been collecting which demonstrate the impact of the change. If your school or district is considering a later start time for high school and/or middle school, CASDA is available as a resource to share an in depth review of the research, national and local case studies and to connect you with others who can share their process, lessons learned, creative solutions and outcomes with you.

References

Baum, K.T., Desai, A., Field, J., Miller, L.E., Rausch. J. & Beebe, D.W. (2014). Sleep restriction worsens mood and emotion regulation in adolescents. Journal of Clinical Psychology and Psychiatry, 55(2), 180-190.

Beebe, D.W., Rose, D. & Amin, R. (2010). Attention, Learning, and Arousal of Experimentally Sleep-Restricted Adolescents in a Simulated Classroom. Journal of Adolescent Health, 47, 523-525.

Boergers, Julie. (January 2015). Benefits of later school start times. Brown University Child and Adolescent Behavior Letter, 31(1), 4-7.

Carroll, Aaron E. "Schools Are Slow to Learn That Sleep Deprivation Hits Teenagers Hardest." The New York Times, March 28, 2016.

Center for Research, Regional Education and Outreach. "A 2020 Vision for Public Education in Ulster County: Later School Start Times for Adolescents." SUNY New Paltz & Ulster School Boards Association. August 2014.

Edwards, Finley. (2012). Early to rise? The effect of daily start times on academic performance. Economics of Education Review, 31, 970-983.

Hamilton Project, The. "Organizing Schools to Improve Student Achievement: Start Times, Grade Configurations, and Teacher Assignments. The Brookings Institute. Policy Brief 2011-08.

Hasler, B.P. & Clark, D.B. (April 2013). Circadian Misalignment, Reward-Related Brain Function, and Adolescent Alcohol Involvement. Alcoholism: Clinical and Experimental Research, 37(4), 558-565.

Hoffman, Jan. "To Keep Teenagers Alert, Schools Let Them Sleep In." The New York Times, March 13, 2014.

McKnight-Eily, L.R., Eaton, D. K., Lowry, R., Croft, J., Presley-Cantrell, L. & Perry, G. S. (2011). Relationships between hours of sleep and health-risk behaviors in US adolescent students. Preventive Medicine, 53, 271-273.

Perkinson-Gloor, N., Lemola, S. & Grob, A. (2013). Sleep duration, positive attitude toward life, and academic achievement: The role of daytime tiredness, behavioral persistence and school start times. Journal of Adolescence, 36, 311-318.

Short, M.A., Gradisar, M., Lack, L.C. & Wright, H.R. (2013). The impact of sleep on adolescent depressed mood, alertness and academic performance. Journal of Adolescence, 36, 1025-1033.

Wahlstrom, Kyla. (December 2016/January 2017). Later Start Times for Teens Improves Grades, Mood and Safety. Phi Delta Kappan, 98(4), 8-14.

Wahlstrom, Kyla. (February 2003). Later High-School Start Times Still Working. The Education Digest, 49-53.

Wahlstrom, Kyla. (December 2002). Changing Times: Findings From the First Longitudinal Study of Later High School Start Times. NAASP Bulletin, 86(633), 3-21.