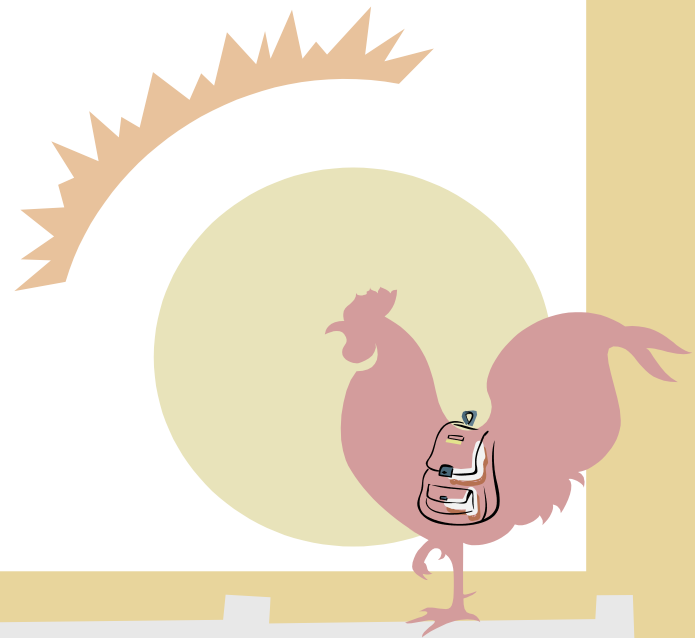


ADOLESCENTS AND SLEEP

REPORT OF THE SCHOOL START TIME ADVISORY COMMITTEE



April, 2010

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ADOLESCENTS AND SLEEP INFORMATION

INTRODUCTION

The Superintendent of Schools formed an Advisory Committee to study the possibility of later school start times as supported by years of research involving the sleep needs of our students. The Committee, comprised of a school administrator, principals, parents and central office staff, began meeting in January, 2010. The Committee's primary goal is to pursue what is best for the health, safety and overall improved academic performance of our North Andover students. This research information has been summarized and is included in this report.

We encourage you to read through this information and invite you to participate in an upcoming survey regarding school start times which will appear on line, after April vacation. We appreciate your support and concerns.

WHAT IS ADOLESCENCE AND WHEN DOES IT OCCUR?

Adolescence is the time period between the beginning of puberty, when reproductive organs become functional and secondary sexual characteristics appear, and adulthood. The Tanner scale, which is a scale of physical development in children, adolescents and adults, indicates that individuals pass through the Tanner stages at different rates, depending in particular on the timing of puberty. Tanner staging and age are highly correlated: early adolescence occurs between 10 to 14 years and late adolescence occurs between 15 to 19 years. (Carskadon, Brown Medical School)

ADOLESCENT HEALTH

Scientific research shows that adolescent body clocks are set differently than younger children and adults. Typically they cannot fall asleep until 11 p.m., when they produce the sleep inducing hormone, melatonin, and they cannot effectively wake up prior to 8 a.m., when their bodies stop producing melatonin. Research shows that younger children are not as sleepy as adolescents in the early morning. (National Sleep Foundation)

Lab studies indicate that the biological need for 9 hours of sleep does not change from ages 10-17. Inadequate sleep results in increased risk of depression, diabetes, obesity, stimulant use and compromised immune function in adolescents. Health experts point to sleep deprivation as a source of stress, tendency to abuse drugs and alcohol, and engaging in risky behavior. (CAREI)

Biologically speaking, sleep deprived adolescents increase the hormone ghrelin in their bodies, triggering hunger, and reduce the hormone leptin (energy) resulting in obesity or weight gain. (Stop Childhood Obesity.com)

The results of the *First Longitudinal Study on the Impact of a Later School Start Time* indicate that students were generally going to bed at the same time as before the time change and getting up an hour later, therefore getting approximately one more hour of sleep each school night. According to more recent studies, this apparently remains the case. (Kubow et al., Wahlstrom)

A study comparing demographically similar schools showed that students in schools with later start times slept one hour more than students in schools with earlier start times. (Frederickson & Wrobel, 1997, as referenced in Mitru)

A study comparing Minnesota high school students in schools with late start times vs. schools with early start time found that in the later schools:

- The average score measuring depression was found to be significantly lower depression;
- The average number of student sick days was significantly fewer;
- There was greater alertness exhibited during class time, exams, and computer activities; and
- There were fewer tardies resulting from oversleeping. (Wahlstrom, et al, 1998, as cited in Mitru)

ADOLESCENT AUTOMOBILE SAFETY

Researchers found a 16.5% drop in auto accident rates for teen drivers when local high schools moved to a later start time or 8:30 a.m. (Journal of Clinical Sleep Medicine-1998)

After studying data in areas with later start times, it was found that accidents decreased by 12% in the first year and 16% the second year. (Patterns, More Sleep, Fewer Student Car Accidents, NY Times 2008).

ADOLESCENT ACADEMIC PERFORMANCE

When schools start later, students contribute to class discussions more, doze in class less, arrive tardy less often, miss fewer days, and visit their doctors less. (JAMA 6/3 2009)

Sleep deprivation impairs learning and long-term memory consolidation. REM sleep that occurs during the last third of the night is crucial to associative learning. When REM sleep is interrupted, a student's ability to concentrate is impaired and this confounds an adolescent's ability to manage stress and control emotion, exacerbates irritability, creates mood swings, and undermines self-esteem and confidence.

(Adolescent Sleep Needs and Patterns: Research Report and Resource Guide National Sleep Foundation 2000)

According to research presented at SLEEP 2009, getting more high-quality sleep is associated with better academic performance. The positive relationship is especially relevant to performance in math.

ADOLESCENT PHYSICAL/ATHLETIC PERFORMANCE

Dr. Charles Czeisler, the Director of the Division of Sleep Medicine at Harvard Medical School and the Chief of the Sleep Medicine Division at Brigham and Women's Hospital in Boston, is better known in the National Basketball Association (NBA) as the Sleep Doctor. A key function of sleep is to restore neurons in the brain, a process that is critical to learning and mastering new information, he said. If basketball players practice a new play and then get a sound night of sleep, they will be 20% better at performing it. But with insufficient sleep, he said, "you simply never get that improvement."

People were taught a simple motor sequence (typing a sequence of keys on a computer keyboard as quickly and accurately as possible), and they practiced it for 12 minutes and were re-tested later. Those trained in the evening and re-tested after a good night's sleep improved the most, by about 20%. The amount of improvement was directly correlated with the amount of Stage 2 (a stage of non-rapid eye movement or NREM) sleep experienced particularly late in the night. "This is the part of a good night's sleep that many people will cut short by getting up early in the morning." The study appeared in the July 3, 2008, issue of *Neuron*.

SURVEY OF AREA SCHOOL START TIMES

In a review of the 10 top ranked school districts in Massachusetts (based on average SAT and MCAS scores), five started their high schools 20 minutes later than North Andover, two started 10 minutes later, one started a half hour later, and only one started at the same time. Of these same districts middle schools, five started 20 minutes later than North Andover, one started 15 minutes later, one started 25 minutes later, one started 40 minutes later, and one started 50 minutes later.

In a review of five school districts with equivalent per pupil spending as North Andover, yet ranked higher (also based on average SAT and MCAS scores), all started their high schools and middle schools at least 15 minutes later than North Andover, and two started their middle schools 30 minutes later.

Finally, in a review of Cape Ann League school districts, only Newburyport starts five minutes earlier than North Andover. Three start 5 minutes later, two start 10 minutes later, two start 15 minutes later, three start 20 minutes later, and two start thirty five minutes later. (See table next page).

CAPE ANN LEAGUE SCHOOL START AND DISMISSAL TIMES

CITY OR TOWN HIGH SCHOOL	START TIME	DISMISSAL TIME
Newburyport	7:20 a.m.	1:55 p.m.
North Andover	7:25 a.m.	1:57 p.m.
Georgetown	7:30 a.m.	2:15 p.m.
Ipswich	7:30 a.m.	2:06 p.m.
North Reading	7:30 a.m.	2:00 p.m.
Masconomet Regional H.S.	7:35 a.m.	2:14 p.m.
Pentucket Regional H.S.	7:35 a.m.	2:15 p.m.
Wilmington	7:40 a.m.	2:05 p.m.
Triton Regional H.S.	7:42 a.m.	2:13 p.m.
Rockport	7:43 a.m.	2:10 p.m.
Manchester-Essex Regional H.S.	7:45 a.m.	2:15 p.m.
Hamilton Wenham	7:45 a.m.	2:20 p.m.
Amesbury	7:57 a.m.	2:30 p.m.
Lynnfield	8:00 a.m.	2:26 p.m.

School Calendar and Start Time Advisory Committee:

Kevin Hutchinson, Assistant Superintendent
Gregg Gilligan, Thomson School Principal
Joan McQuade, Middle School Principal
Carla Scuzzarella, High School Principal
Pam Zengilowski, Transportation Coordinator

Cindy Jalbert, Parent
Maggie Krupkowski, Parent
Lynne Mehlman, Parent
Maria Mesinger, Parent
Bonnie Wolstromer, Parent

For more information about the importance of sleep for adolescents:

National Sleep Foundation - <http://www.sleepfoundation.org/>

The Science of Lost Sleep in Teens -
<http://www.sciencedaily.com/releases/2006/03/060328081509.html>