



## WHY DO WE CARE ABOUT TEEN SLEEP?

SLEEP IMPACTS EVERYTHING.

# signs of sleep deprivation

- Inability to handle stress
- Poor memory
- Inability to concentrate
- Increased appetite & cravings for sweet, salty and starchy foods
- Vision problems
- Poor decision making
- Diminished motor skills
- Mood swings
- Medical problems

# most teens are sleep deprived

- Teens need an average of 9 hours of sleep per night
- Everyone has a natural sleep/wake cycle
- In the teenage years, the hormone melatonin, which tells us when to sleep, activates later at night
- Teens' melatonin kicks in at about 11 pm; prior to puberty it kicks in between 8 to 9 pm
- The natural teen sleep cycle is 11 pm- 8 am
- The natural sleep cycle for younger children is 8 pm-6 am
- Right before melatonin release at 11 pm, teens are more awake than at any other time of the day

Source: Mayo Clinic article "Why is Your Teen So Tired?"

# physical benefits of more sleep

- **Fewer sports injuries**

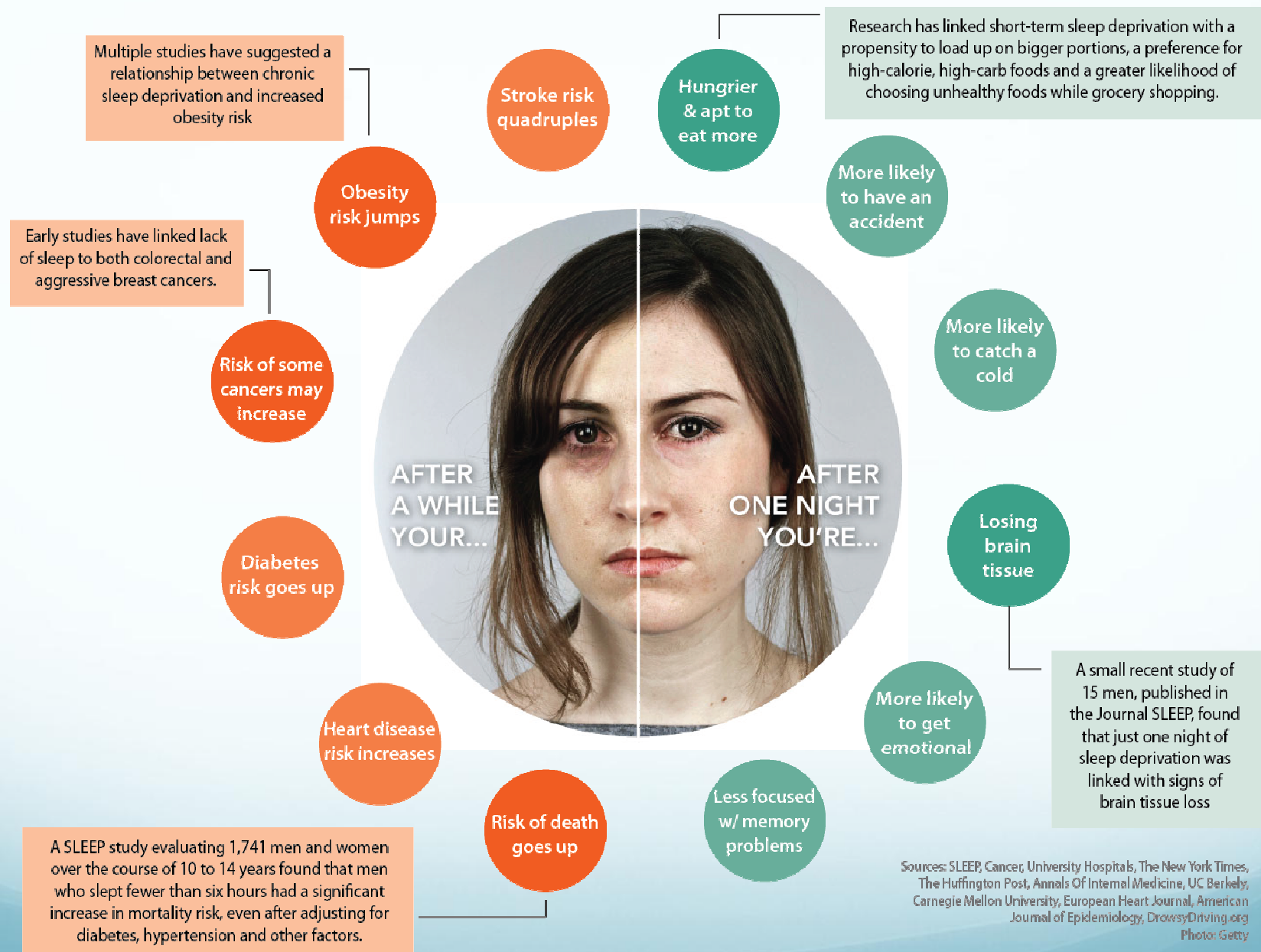
- American Academy of Pediatrics study
  - 8 or more hours of sleep per night = 68% less likely to experience sports injuries
  - The higher the grade level, the greater likelihood of injury (2.3 times per grade level)
  - Number of sports played and hours of participation were not factors.

- **Increased athletic performance (Stanford University)**

- Stanford Swim Team Study – existing sleep hours v. 10 hours per night (for 6-7 weeks)
  - 15 meter sprint time improved .51 seconds
  - .15 seconds quicker off the block
  - Improved turn time by .10 seconds and kick strokes by 5 kicks
- Stanford Men's Basketball Team
  - Sprint times decreased by 5%, free throw percentage increased by 9%, and 3-point field goal accuracy increased by 9.5%
- Coaches have now adjusted training and travel schedules to accommodate more sleep

# physical benefits of more sleep

- **Sleep solidifies experiences and knowledge to memory**
  - Dr. Charles Czeisler, Director of the Division of Sleep Medicine at Harvard
    - Consulted by NBA, NHL and other major sports groups
    - Research shows getting enough sleep after training helps commit the workout to muscle memory
      - The same holds true for academic learning
      - Solidifying knowledge requires both REM and deep sleep
    - “Interestingly, if you don’t sleep the night after training, then even if you sleep the next night or the next night, you never learn.”
    - Asking athletes to play on minimal sleep is the same as asking them to “play with one hand tied behind their back.”
    - Studies show reaction time nearly triples when a person pulls an all-nighter.
    - In males, 5≤ sleep per night for one week causes a drop in testosterone as if the person has aged 11 years (16 yr old has the levels of a 27 yr old). Testosterone fuels muscles and impacts decision-making abilities.
      - Players cannot perform at peak levels when testosterone is depleted



# physical benefits of more sleep

- **Fewer car accidents**

- Virginia Beach vs. Chesapeake study showed 40% lower accident rate in the district with the later start time
- 2008 study in Journal of Clinical Sleep Medicine found 16% drop in accident rates when HS's in Fayette County, KY changed from 7:30 a.m. to 8:30 a.m. start times
- Driving while drowsy is like driving with a blood alcohol level of .05%
- Jackson Hole, WY schools went to 8:55 am start time and saw 70% drop in teen car accidents.

- **Less obesity**

- Rate of adolescent obesity has more than tripled over the last four decades
- Perelman School of Medicine at the University of Pennsylvania followed 1000 students 14-18 years old from freshman through senior year in HS
  - Every hour of increased sleep resulted in a lower BMI for ALL participants with higher reduction in those at the higher end of the BMI spectrum
  - Based on results, authors of study suggest increasing sleep from 8-10 hours per day at age 18 could result in a 4% reduction in the number of adolescents with a BMI above 25—roughly 500,000 fewer overweight adolescents.

# physical benefits of more sleep

- **Increased participation in after-school activities**
  - Wilton, CT – rise in athletic program participation with later start times and rise in extra curricular activities participation
    - Possibly due to students unable to participate due to working parents not being able to pick them up prior to moving to later start times
  - Edina District, MN 7100 students went to later start times 6.5 years ago
    - "Coaches considered this the death knell for athletics, but there was no negative impact on participation or the success rate. Few students reported staying up later." —Kyla Wahlstrom, University of Minnesota
    - 92% were happy with the start time change after one year.
- Overall, schools notice an increase or no change in levels of extra-curricular activity participation.



## Schedule Comparison

Loudoun County High Schools start at 9:00 a.m. and release at 3:50 p.m.

(Earliest bus pick-up in Fauquier is before 6 a.m.)

**Maria's Schedule in Loudoun**

**Jenny's Schedule in Fauquier**

|                                 |          |                                 |
|---------------------------------|----------|---------------------------------|
| SLEEPING                        | 5:00 am  | SLEEPING                        |
| SLEEPING                        | 5:30 am  | Alarm Rings                     |
| SLEEPING                        | 6:30 am  | Bus stop                        |
| Alarm Rings                     | 7:00 am  |                                 |
|                                 | 7:30 am  | <b>SCHOOL STARTS</b> - Homeroom |
|                                 | 7:40 am  | Calculus                        |
| Bus Stop                        | 8:00 am  |                                 |
| <b>SCHOOL STARTS</b> - Calculus | 9:00 am  |                                 |
|                                 | 9:25 am  | Spanish                         |
| Spanish                         | 10:35 am |                                 |
|                                 | 10:55 am | Lunch                           |
|                                 | 11:27 am | AP English                      |
| Lunch                           | 12:12 pm |                                 |
| Literature                      | 12:45 pm |                                 |
|                                 | 1:03 pm  | Government                      |
| Government                      | 2:20 pm  |                                 |
|                                 | 2:35 pm  | <b>SCHOOL'S OUT</b>             |
|                                 | 3:00 pm  | extracurricular/practice starts |
| <b>SCHOOL'S OUT</b>             | 3:48 pm  |                                 |
| extracurricular/practice starts | 4:00 pm  |                                 |
|                                 | 5:00 pm  | extracurricular/practice Ends   |
| extracurricular/practice Ends   | 6:00 pm  |                                 |
| Dinner with family              | 6:30 pm  | Dinner with family              |
| Light's Out                     | 11:00 pm | Light's Out                     |

**8.0 hours of sleep**

**6.5 hours of sleep**

# emotional benefits

- **Fewer Emotional Outbursts**
  - Numerous studies and results of student surveys after shift to later school start times show a substantial decrease in outbursts and moodiness
- **Decreased incidents of bullying**
- **Decreased incidence of violence, including weapons**
  - NIH study shows students with insufficient sleep had higher odds of engaging in the majority of school violence-related behaviors examined compared to students with sufficient sleep.
    - Males with insufficient sleep were at increased risk of weapon carrying at school
- **Effect on depression, anxiety & suicide**
  - American Academy of Sleep Medicine study of 4,175 children age 11-17 found sleeping  $\leq 6$  hours/night increased the risk for major depression
  - A recent study has found a causal link between moderate to high risk of suicide and sleep deprivation. For every one-hour increase in quality sleep, there was a 72-percent decrease in suicidal ideation and an increase in positive attitude

*“The single biggest problem I face in my classroom is sleep deprivation in my students.”*

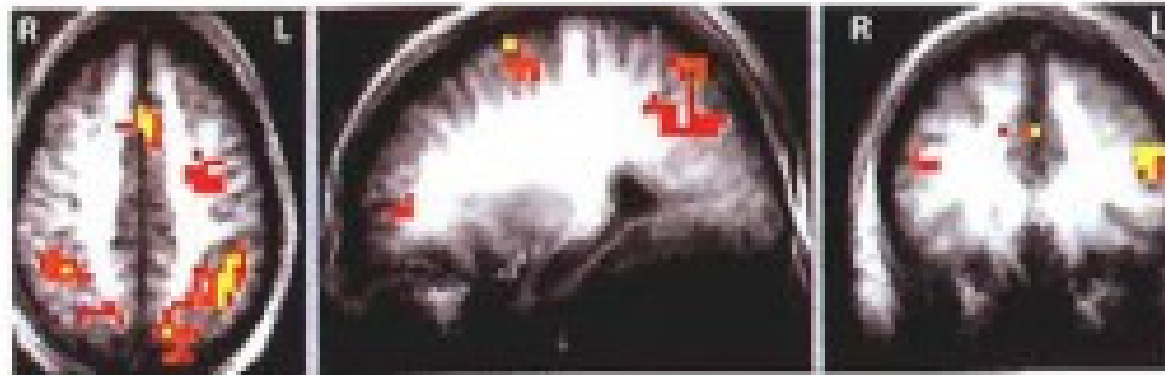
—FHS English teacher

# scholastic benefits (thinking skills)

- **Improved abstract thinking skills**
- **Improved focus and participation in class**
  - Sleep deprivation can sometimes “mimic or exacerbate symptoms of ADHD, including distractibility, impulsivity, and difficulty with effortful control of attention.”
  - Evidence shows that sleep deprivation has marked influences on the ability to perform complex tasks or tasks that require attention in two or more areas at the same time. (see next slide)
- **Improved attendance and fewer tardies**
- **Higher graduation rates**

## Effect of sleep deprivation on brain activation while performing mathematical tasks

**Rested**



**Sleep Deprived**



# improved academic performance

- **Wake County (NC) study showed a 3 percentile point gain in math and reading test scores for the average student.**
  - The effect was larger for the lower end of the distribution of test grades
  - Study used data on WCPSS middle school students from 1999-2006 performance on standardized tests.
    - Considerable variation in start times across schools in the district as well as variations in start times within the schools over time.
    - One of the largest school systems in the country.
    - Increased academic performance within the same school in the years with later start times. (times change year to year based on transportation issues)
- **Nauset High School, Massachusetts after a one hour later start time in 2012**
  - 53% drop in the number of failing grades
  - 38% drop in number of D's and F's
  - Suspensions for disciplinary reasons – 166 in Sept./Oct. of previous year to 19 in Sept./Oct. of this year (2013)

# myths & misconceptions

Kids will just stay up later.

- Study in Journal of Developmental & Behavioral Pediatrics shows that when delaying start time by 25 minutes, the number of students getting at least 8 hours of sleep increased from 18% to 44%. Students got 29 more minutes of sleep per night.

Not enough time for homework.

- University of MN (CAREI) study with over 3 years of data showed students completed more of their homework during school hours because they were more alert and efficient.
- Aren't you less productive when you are tired?

# myths & misconceptions

## I won't have time for work or extracurricular activities

- In suburban MN schools, participation in after-school athletic and other activities, and jobs remained the same.
- Schools in Wilton, CT saw an increase in participation in athletics and after school activities.
- Loudoun County students do it and have highly ranked sports teams, band, etc.

## It's safer to start high schools first.

- There are countless instances of teens being struck, killed and assaulted while waiting for a bus in the dark. It's not safe for **any** child to be waiting at a bus stop in the dark.
- Attempted abduction last year in Fauquier County from a bus stop while it was dark out.



# myths & misconceptions

We (parents) did it and we turned out just fine.

- Every parent's dream is to give his or her children a better future.
- 40-50 years ago we didn't know the effects of smoking on our health and **many schools had smoking courts**
- 40-50 years ago we didn't know the importance of seat belts or car seats.
- Kids today have more pressures and busier lives.

Kids just need to go to bed earlier.

- Student sleep can improve by reducing exposure to distractions (TV, cell phones, computers, etc.) and following good sleep hygiene habits.
- Research shows that even with these things, they cannot get enough sleep (8.5-9.25 hrs) if they need to get up for a 7:30 a.m. start time.
- Biologically programmed not to go to sleep until 11:00 p.m. **To get 9 hours (with a 7:30 a.m. start time), they would have to be in bed and fast asleep between 8-9 p.m.**
- Our earliest bus pick-up is before 6 a.m. so we have students waiting at bus stops at 5:45 a.m.

# myths & misconceptions

Early starts prepare teens for the real world.

- It's not a matter of will. It's a matter of biology.
- Shifted circadian rhythm (body clocks) means they cannot fall asleep before 11 p.m. The same shift occurs in adolescent mammals.
- Very few colleges start classes before 8 a.m. Duke University mandates no classes before 8:30 a.m.
- Very few jobs start at 7:30 a.m., nor do they involve doing calculus at that hour, or going home with hours of homework every night. Adults have some degree of

We're coddling our kids by allowing them to start school later.

- It is no more coddling kids than installing car seats or eliminating smoking indoors. These are now seen as mainstream public health measures.

# how can we change?

- Gain School Board support to look at the issue and solutions
- Community and student education
- Teacher and administrator education and feedback
- Parent and student input – **without community support this change will not happen**
- Look to others that have changed
  - **72 out of 95 counties in VA start at 8 a.m. or later**
    - Arlington County switched in 2001, Falls Church City in 2004 or 2005
    - Fairfax is slated to change in fall 2015
  - Wilton, CT (rural, student body of 7000+) and others
- Committees of staff, parents and HS students work together to provide solutions to potential problem areas
  - Transportation
  - Childcare
  - Athletic events

# one transportation option

*We explored one transportation option to see if it would be possible to move start times without having to purchase more buses or simply swap ES with MS/HS start times.*

*This does not mean that this is what we would end up with.*

- Move elementary schools up 30 minutes to an 8 a.m. – 3 p.m. schedule
  - More buses are required for elementary schools
  - May help parents who need before-school care because they have to get to work
- Move high school and middle school to a 9 a.m. – 4:00 p.m. schedule
  - Fewer buses needed for HS/MS runs.
  - Extra buses from ES runs could be used for HS athletics potentially without too much delay from the current schedule (currently buses not available until 4:15 or later)
- Similar to what Loudoun County does, except they are on a 3-tier bus system
- Would not require purchasing more buses

# pros & cons

## CONS

- Some bus drivers work jobs between runs and this *may* impact those.
  - How many would be affected?
- Older children not available to watch younger children right after school.
  - Investigate what other districts do to solve this problem
  - How many older children really are relied on to watch the younger ones?
  - FCCC after-care is available in all elementary schools
  - Look at neighborhood solutions

## PROS

- Some parents may become bus drivers since they can bring their child to work. 7:30 a.m. start times are a negative because it's too early to get their toddlers up when they are reporting to work as early as 5:00 a.m.
- Some parents of ES children may save on before-school care.
- HS athletes will not have 2-3 hours to fill between school and away athletic events.
- Cost neutral
- No child waits for a bus in the dark (most of the time)
- Less traffic issues (at schools) in the morning due to likelihood of fewer drop-offs. Parents drop off now so kids can get extra sleep.
- More time in the mornings to make the call on snow days.

*“The best thing you can do is the right thing; the next best thing you can do is the wrong thing; the worst thing you can do is nothing.”*

—Theodore Roosevelt



# for more information

- Follow us on facebook at <https://www.facebook.com/pages/Sleep-Matters-Fauquier/217100471812507>
- Follow us on twitter at [@moresleepFQ](https://twitter.com/moresleepFQ)
- <http://www.startschoollater.net>
- <http://www.sleepfoundation.org/article/sleep-topics/school-start-time-and-sleep>
- <http://www.sleepinfairfax.org/research.htm>
- <http://www.nimh.nih.gov/health/publications/the-teen-brain-still-under-construction/index.shtml>
- <http://www.theatlantic.com/health/archive/2014/04/for-better-performance-athletes-need-sleep/361042/>
- <http://www.brainpickings.org/index.php/2012/05/11/internal-time-till-roenneber/>
- <http://youtu.be/t5ylqK-aPX8>
- <http://healthysleep.med.harvard.edu/healthy/matters>

# Thank You!

Your voice matters. This initiative will be community driven. You can respond to [sleepmattersfauquier@gmail.com](mailto:sleepmattersfauquier@gmail.com) and/or your school board representative.