

Body & Health

Early school starts can turn teens into 'zombies'

Doctors' orders: Start schools later to make teens happier — and healthier

By [Stephen Ornes](#) 10:11am, September 11, 2014



Most U.S. middle schools and high schools start too early for students to get as much sleep as they need, research shows. As a result, many teens start the school day — and then shuffle through it — way too sleepy to be healthy.

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Teens and their teachers know well that early-morning classes can be grueling. Doctors now have a prescription: For better teen health, push the snooze button on school start times.

Janet Croft studies teens and sleep at the Centers for Disease Control and Prevention (CDC) in Atlanta, Ga. U.S. high schools, she says, “start at such an early time that most teens are essentially brain dead when they go to these early classes.” As a result, she says, too many students start their day as “walking zombies.” Too little sleep has become so common among teens that the CDC calls it an epidemic, or a widespread public-health problem.

But zombies, take heart! There’s a cure, says the American Academy of Pediatrics (AAP). This professional group includes more than 60,000 doctors who treat or study children. And this group

has just issued a pair of papers calling for change.

One of the reports emphasizes the importance of sleep for teens and outlined the dangers from not getting enough zzzz's. Studies in the past have shown over and over that sleep-deprived teens face higher risks of obesity and depression — and even car accidents.

Many teens get too little sleep because they attend middle and high schools that start earlier than 8:30 a.m., according to the AAP. Those early start times throw off a student's internal body rhythm, called the circadian clock. Too little sleep disrupts that clock and causes problems.

The other report offers a simple way to help teens stay healthy: Start the school day later. In its formal statement, the AAP "urges high schools and middle schools to aim for start times that allow students the opportunity to achieve optimal levels of sleep." Students, parents, doctors and school officials all need to heed this public-health problem, the group says.



Too many students start their day like "walking zombies," says Janet Croft of the Centers for Disease Control and Prevention. The CDC refers says the sleep deprivation behind this is an epidemic.
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Even parents have been in the dark

The science behind this call for later school starts has been accumulating for decades, says physician Judith Owens. She studies sleep medicine at the Children's National Health System in Washington, D.C. She led the team behind the two new papers. Both appeared August 25 in the journal *Pediatrics*.

For biological reasons, the average teen just can't go to sleep much before 11 p.m.

— *Judith Owens, Children's National Health System*

Owens hopes the papers will clear up common misconceptions about students and sleep, especially by their parents. All too often, she says, "parents don't really know how much sleep teenagers need."

Middle- and high-schoolers typically require 8.5 to 9.5 hours of sleep per night. But few get that. The National Sleep Foundation is a nonprofit organization in Washington, D.C., devoted to sleep research. Every year, this group polls thousands of people to find out more about sleep habits and problems. In 2006, they focused on teens.

That poll found that nearly 6 in every 10 middle school students — and 9 in 10 high school students — are sleeping too little.

Yet many parents aren't aware of this. In the same poll, 7 of every 10 parents said they believed their kids did sleep enough. That poll shows too many parents are unaware of the science on teen-sleep needs, says Owens. (A 2014 poll by the National Sleep Foundation suggests parents are

getting smarter: More than half now report their kids do not sleep enough.)

Zombie-making biology

Kyla Wahlstrom studies the science of sleep at the University of Minnesota in Minneapolis. As a former teacher, she has spent a lot of time with sleep-deprived teens.

“An incredible number of students are either sleeping at their desks or they’re zoned out, in a fog,” she says. “They’re sitting there like a lump, not asking questions or raising their hands.”

But don’t blame laziness, says Wahlstrom. Or peer pressure, or school demands, or social engagements. Blame biology.

During adolescence, the body goes through many changes. These include a shift in sleep needs.

Researchers in the 1990s began to show that during puberty, the time at which the body naturally wants to enter sleep moves to a later time. An adolescent needs just as much sleep as she did as a young child — but her body needs it to start later in the night and to last longer into the morning.

Then, a decade ago, scientists showed that the sleep cycles of tweens shift later each year by 12 to 18 minutes. And that trend continues every year between ages 10 and 20. So a 10-year old might easily fall asleep at 8 p.m. By the time she is 17 or 18, however, her body now naturally wants to stay up until 10:30 or 11 p.m.



A National Sleep Foundation poll found that more than one-in-four teens is so tired that he or she falls asleep in school at least once a week.

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Two aspects of biology may contribute to that shift, studies show. One has to do with melatonin (MEL-ah-TOH-nin). It’s a hormone secreted by the pineal (Py-NEE-ul) gland, a tiny structure deep inside the brain. Melatonin helps to regulate the body’s natural day-night rhythms. It does this by causing a person to become drowsy and by lowering the body’s core temperature.

During adolescence, melatonin is secreted later in the day and ramps up at night. This means teens can have trouble if they try to fall asleep before enough of the chemical has been released. And melatonin may not stop affecting a teen until around 8 a.m., notes Wahlstrom. So kids roused from sleep too early may feel drowsy for hours afterward.

Explainer: The Teenage Body Clock

Then there’s the issue of *sleep pressure*. It’s a natural process that tells the body when it needs to sleep. This signal grows stronger as night approaches. In teens, this pressure takes longer to accumulate. So teens don’t become sleepy as early as they did when they were children.

Most people don't understand the changes that affect a teen's circadian clock — not even teens themselves, notes Owens.

Some people say "teens should go to bed earlier" to get enough sleep, she notes. "But for biological reasons, the average teen just can't go to sleep much before 11 p.m."

The dangers of deprivation

Acting like a zombie isn't the only downside to sleep deprivation. Researchers say that not enough sleep also can lead to dangerous behaviors. About 100,000 car accidents each year occur when a driver is too tired to drive, according to studies of traffic reports. More than half of those drivers are under age 25.

Some of those accidents might have been prevented if teens got more sleep, Wahlstrom says. In fact, the accident rate is already declining in areas where schools have later start times, she notes. For instance, 16- to 18-year-old drivers in Wyoming's Teton County School District were involved in 23 crashes during the 2011 to 2012 school year. The next year, the school shifted its start time to almost one hour later — and the number of crashes fell to seven. Wahlstrom led a three-year study of that school, and seven others, and released the findings in a February 2014 report. Other schools with later start times also saw a drop in accidents, she found.



Teens are at higher risk for traffic accidents when they are regularly sleep deprived. This can be another problem associated with too-early school-start times. *bowdenimages/ iStockphoto*

In her research, Wahlstrom surveyed more than 9,000 teens. She found a wide variety of other ways that too little sleep can endanger adolescents.

Teens "make poor choices when they're sleep deprived, whether it's related to drugs, cigarettes, alcohol, sex or other things," she says. "We ask on our survey, 'Have you ever made any choices without thinking?' The kids say: 'Yes, I was making bad choices.'"

Getting enough sleep can help a teen on the inside, too. Several studies have shown that children and adolescents who don't sleep enough are more likely than other kids to become obese, or extremely overweight. (Many of these studies found that the more sleep a person misses on a regular basis, the higher his chances of becoming fat.) Sleep-deprived teens also are more likely than their peers to suffer from anxiety, depression and mood disorders. The list goes on: Studies have even connected insufficient sleep to lower grades in middle school, high school and college.

"It's been under-recognized how important sleep is, particularly to teenagers," says Croft at the CDC.

Solutions to the problem

Early start times aren't the only problem keeping adolescents from getting enough sleep, of course.

Many teens contribute to the problem with their own choices.

Students may take stimulants such as caffeine, for instance. This can keep them awake when they

need to work or drive — but later make it difficult for them to fall asleep. Also, multiple studies have shown that using electronic devices like cell phones and tablet computers at night can make it hard for a teen to sleep. They throw off a person's circadian clock.

But middle- and high-school students can take steps to stop those behaviors that can sabotage (SAA-boh-tahzh) sleep. Nearly 3 in every 4 kids between 6- and 17-years old keep an electronic gizmo — such as phone, tablet or laptop — in their room at night, the 2014 National Sleep Foundation poll found. And that can cause big problems: That same poll reported that kids who keep those devices on at night sleep up to an hour less, on average, than kids who don't.



Most computer screens and other electronics give off a blue light that confuses the brain about what time of day it is. That makes these dangerous to use near bedtime.

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“The use of any electronic device in the night time is extremely disruptive for sleep,” explains Wahlstrom. Their screens give off a form of blue light. “The blue light from those devices signals the brain that it’s daylight,” she notes. “That will temporarily stop the brain from preparing for sleep.” She recommends that teens keep electronic devices out of their rooms at night.

Sleep, after all, is serious business. Not getting enough can land a person in trouble. Fortunately, teens can choose to engage in behaviors that improve their ability to sleep. Owens points to several of these, which might really help students who attend schools with early start times.

For instance, she recommends “strategic” napping. “That means a brief, 15- or 30-minute nap in the mid- to late-afternoon.” The important thing, she says, is to make sure that naps are “not so long that you have trouble falling asleep that night.”

She does *not* recommend that students sleep late on the weekends to make up for lost zzzz’s. That practice, she says, confuses a person’s sleep and wake cycles. “It puts kids in a permanent state of jet lag, like flying from New York to Los Angeles and back every weekend.”

Already, about 1,000 U.S. schools — out of nearly 25,000 — have shifted to later start times.

But will others? “I certainly hope so,” Owens says.

She hopes the new papers give confidence to school districts already thinking about moving to a later start time. And for schools that aren’t moving in that direction, she thinks the papers might start discussions about a need to move to later school starts.

“Perhaps it will spur them to explore these possibilities,” she says. “This is clearly in the best interest of middle- and high-school students, in terms of health, safety and performance.”

Power Words

adolescence A transitional stage of physical and psychological development that begins at the onset of puberty, typically between the ages of 11 and 13, and ends with adulthood.

anxiety A nervous disorder causing excessive uneasiness and apprehension. People with anxiety may even develop panic attacks.

caffeine A stimulant, which activates the nervous system and heart. The leaves, seeds and fruits of many plants contain caffeine. In coffee plants and tea bushes, caffeine acts as a natural pesticide. It will kill or harm insects that attempt to dine on the plant. Caffeine is also toxic to some types of plants, bacteria — even frogs and dogs.

Centers for Disease Control and Prevention, or CDC An agency of the U.S. Department of Health and Human Services, CDC is charged with protecting public health and safety by working to control and prevent disease, injury and disabilities. It does this by investigating disease outbreaks, tracking exposures by Americans to infections and toxic chemicals, and regularly surveying diet and other habits among a representative cross-section of all Americans.

circadian Recurring naturally on a 24-hour cycle.

circadian rhythm Biological functions such as body temperature and sleeping/waking times that operate on a roughly 24-hour cycle.

depression A mental illness characterized by persistent sadness and apathy. Although these feelings can be triggered by events, such as the death of a loved one or the move to a new city, that isn't typically considered an "illness" — unless the symptoms are prolonged and harm an individual's ability to perform normal daily tasks (such as working, sleeping or interacting with others). People suffering from depression often feel they lack the energy to get anything done and have difficulty concentrating on things or showing an interest in normal events. Many times, these feelings seem to be triggered by nothing; they can appear out of nowhere.

epidemic A widespread outbreak of an infectious disease that sickens many people in a community at the same time.

epidemiologist Like health detectives, these researchers figure out what causes a particular illness and how to limit its spread.

hormone A chemical produced in a gland and then carried in the bloodstream to another part of the body. Hormones control many important body activities, such as growth. Hormones act by triggering or regulating chemical reactions in the body.

jet lag A temporary disruption of bodily rhythms caused when someone travels across several time zones in a matter of hours.

melatonin A hormone secreted in the evening by a structure in the brain. Melatonin tells the body that it is nearing time to sleep. It plays a key role in regulating circadian rhythms.

obesity Extremely overweight. Obesity is associated with a wide range of health problems, including type 2 diabetes and high blood pressure.

pediatrics Relating to children and especially child health.

puberty A developmental period in humans and other primates when the body undergoes hormonal changes that will result in the maturation of reproductive organs.

stimulant A substance that causes temporary improvements in either mental or physical function

or both. Caffeine is a mild stimulant that for a short while enhances alertness and helps fight drowsiness. Other stimulants, including some drugs, have stronger or longer-lasting effects.

tween A child just approaching his or her teenage years. Tween is a term usually used for 11- to 12-years olds.

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'ZOMBIE-MAKING' SCHOOL START TIMES

D M E R W Q Q A X Z S N N C B W E I I W
 V M L V E R U T A R E P M E T R U E P J
 C H Z P H B Z B S J N E U T G Y B O C O
 L R H Y T H M H W W O G D G C C P E R E
 I F N T I W O X D A H J V M W L Q Q Q Q
 O H P K V T E D S V P I I R R D F Q Q D
 P J U H C Z Z E G E L L O C X G Q E N W
 K U C K T O Y G N S L B N G T U W H C E
 P X B P N C L A S S E S N H Y D N I O X
 D E E E T E R C E S C I G P E D N Y J W
 U U D G R K F C I P N I B P L O S E F E
 M G L P I T G T A R E H R M R W T Q T E
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 T F S T N E D I C C A L P M X E G R M O
 L U R Z J O C O N D B H V Y M C V L Y Z

ACCIDENTS	JET LAG	SECRETE
ADOLESCENCE	MELATONIN	SHIFT
BLUE LIGHT	MORNING	SNOOZE
BRAIN	MOVING	TEMPERATURE
CELL PHONES	NAPPING	TWEENS
CIRCADIAN	OBESITY	WEEKEND
CLASSES	OVERWEIGHT	ZOMBIES
CLOCK	PARENT	ZONED
COLLEGE	PEDIATRICS	
DEPRESSION	PINEAL	
DROWSY	PUBERTY	
ELECTRONIC	RHYTHM	

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