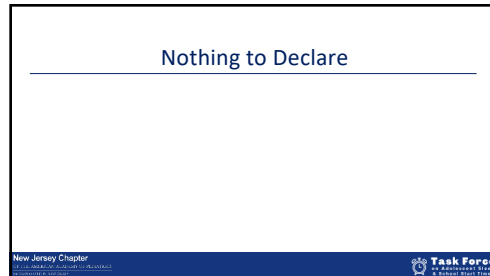


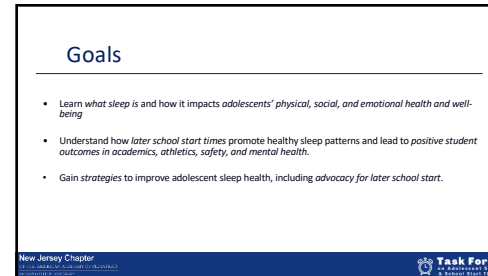
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4

Key Takeaways

- Sleep needs:
 - Teen 8-10 hrs (8.5-9.5 hrs is sweet spot)
- Adequate sleep improves:
 - memory, well-being/mood, academics, sports performance
- Inadequate sleep increases:
 - obesity, car accidents, sports injuries, depression, attention/focus problems, substance use, poor immunity, etc
- Healthy sleep tools:
 - regular bedtime/wake up time, dim lights, shut off electronics, limit late exercise/sports; LATER SCHOOL START

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How many here slept last night?

Think about asking your students about sleep:

Difficult to wake up?

Still tired?

Difficult to fall asleep when your parents wanted you to?

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Why Are Teens So Tired?



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Why Are Teens So Tired?

- Majority of our teens are sleep deprived
 - >70% get less than 8 hours sleep
- Sleep changes occur right at the onset of puberty
 - Before most physical changes noticed, sleep cycles shift later
- Puberty onset
 - Girls - 8-13 yrs (Average 10 yrs)
 - Boys 9-14 yrs (Average 11-12 yrs)

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Sleep cycle changes in adolescence

- Fall asleep later
 - By age 12.5 yrs, average 11:00 pm
- Get sleepy 2 - 3 hours later than grade schoolers

Why?

Melatonin

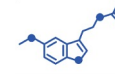
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Melatonin

What is it?

- Hormone released from pineal gland in the brain
- Regulates circadian rhythms, initiates and maintains sleep
- Helps regulate reproductive cycles and breeding



What changes in teens?

- Melatonin secretion shifts later
- Secretion starts approx 10:30/11pm continues until approx 8am
- Reverts to earlier secretion (adult pattern) when in early 20's
- Happens to mult species worldwide (prob all mammals)

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Sleep cycle changes in adolescence

BUT

- Teens still need 8-10 hours of sleep
 - Minimum 8 hours; average 9 hours for high schooler
 - Fall asleep at 11pm - when to wake up?
 - Sleep: average teen
 - (7am teen who needs minimal sleep)

*Teens' bodies
naturally want to go
to sleep at 11pm and
wake at 8am*

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What is Sleep?

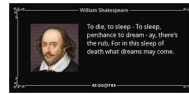
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What is Sleep?



WE ARE SUCH STUFF AS DREAMS ARE MADE ON, AND OUR LITTLE LIFE IS DRINGLES WITH A SLEEP



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What is Sleep?



I dream in colour, and its always very surreal. My dream world is complete. Hieronymus Bosch and Dalí: I love it, I look forward to it every night

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What is Sleep?



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What is Sleep?

- 1/3 of our lives
- *NOT* optional
- Brain active:
 - Processing information
 - "Cleaning the brain"

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- May look different in different species
- Pets?
- Even Jellyfish (no brain)
- Dolphins - 1/2 brain at a time
- Waterfowl - while swimming



Task Force
on Adolescent Sleep
& School Start Times

Task Force
on Adolescent Sleep
& School Start Time

4 hours


Task Force
on Adolescent Sleep

16 hours


Task Force
on Adolescent Sleep

5

People?



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People?

School Age 9-11 hrs
Teen 8-10 hrs



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What Happens When We Sleep



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Sleep Cycles

- Multiple cycles during the night
- Stages repeat - Over and Over
- Predictable




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Sleep Cycles

****Time in each stage changes**

- Later in night
 - more REM
 - less nonREM





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Stages of Sleep

The 4 Stages of Sleep






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Stages of Sleep

The 4 Stages of Sleep






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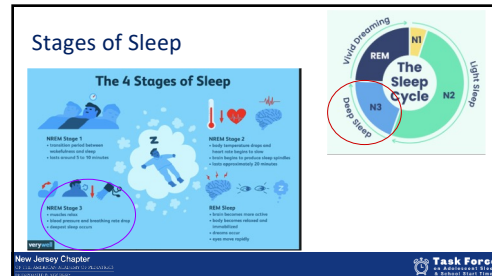
Stages of Sleep

The 4 Stages of Sleep

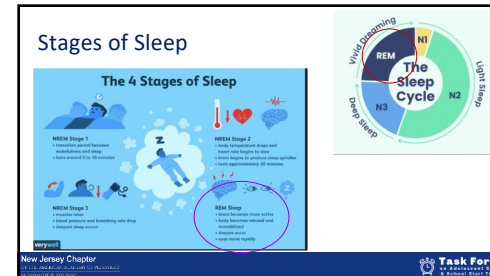



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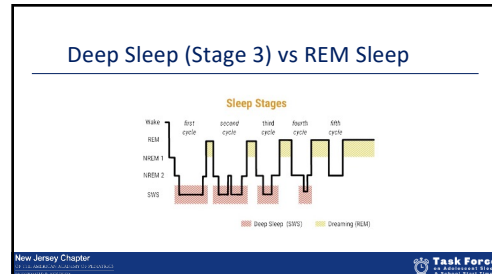
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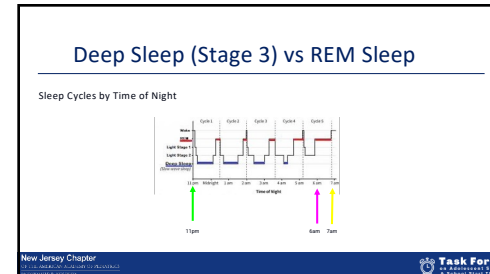
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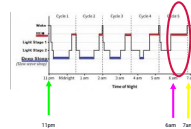
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Deep Sleep (Stage 3) vs REM Sleep

Sleep Cycles by Time of Night



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Task Force on Adolescent Sleep & Mental Health

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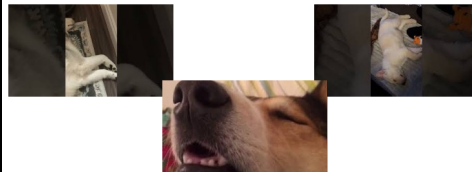
REM sleep

- **DREAMING**
- Increased brain activity
 - MEMORY
 - LEARNING
 - CREATIVITY

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REM sleep



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Mental Health Awareness Month

Dream sleep (REM) is believed to be **critical** for emotional processing, creativity, and problem solving, as it takes new memories and puts them in context from a **wider** point of view.



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Task Force on Adolescent Sleep & Mental Health

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Mental Health Awareness Month

Dream sleep (REM) is believed to be **critical** for emotional processing, creativity, and problem solving, as it takes new memories and puts them in context from a **wider** point of view.

REMEMBER THIS!

projectsleep

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908.261.0400 | WWW.NJPROJECTSLEEP.ORG

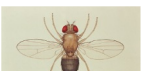
Task Force
A National Task Force
Addressing the Needs of Veterans

Circadian Rhythm

What is it?


“Biological Clock”

- Roughly 24 hours cycle
- Internal clock
- Affects all animals
 - (so must be important)



Drosophila melanogaster

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www.njshg.org

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on Assisted
Reproductive
Technologies

CIRCADIAN RHYTHM

The infographic illustrates the 24-hour cycle of human activities and their corresponding times. The cycle is divided into four quadrants: Morning (6 AM - 12 PM), Afternoon (12 PM - 6 PM), Evening (6 PM - 12 PM), and Night (12 PM - 6 AM). Activities include waking up, eating, working, exercising, sleeping, and dreaming.

Time	Activity
6:00 AM	WAKE UP
9:00 AM	EAT BREAKFAST
12:00 PM	WORK
3:00 PM	EXERCISE
6:00 PM	EAT DINNER
9:00 PM	SLEEP
12:00 AM	DREAM

Circadian Rhythm

Circadian Rhythm Disruptors



Bright Light



Eating at Night



Sleeping Late



Travel

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NJ State Board of Education
NJ State Office of Education



Task Force
on Assessment
and Accountability

New Jersey Chapter
OF THE AMERICAN ASSOCIATION OF PEDIATRIC
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100 UNIVERSITY BLVD., SUITE 200
NEW JERSEY, NJ 07102
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New Jersey Chapter OF THE AMERICAN ASSOCIATION OF UNIVERSITY PROFESSORS  Task Force on Adolescent Site & School Start Time

New Jersey Chapter
OF THE AMERICAN ASSOCIATION OF POLICE
REPRESENTATIVE, NEW JERSEY

Task Force
on Adolescent Stress
& Trauma (Next Steps)

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OF THE AMERICAN ASSOCIATION OF POLICE
INCORPORATED IN 1907

Task Force
AN ADVISORY BODY FOR
A PUBLIC HEARING

Case Study - Chatham

Data pre and post start time change:

- Decreased D's and F's
- Decreased tardies and absents
- Student self report:
 - more sleep
 - less stress
 - less suicidality
 - more alert
 - better mood



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Case Study - Ridgewood

My children make the bus!

Only issues were in first 2-3 weeks with bus schedules.

Games, clubs, extracurriculars, after school jobs all running smoothly

A few stories....



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Key Takeaways

- Sleep needs:
 - Teen 8-10 hrs (8.5-9.5 hrs is sweet spot)
- Adequate sleep improves:
 - memory, well-being/mood, academics, sports performance
- Inadequate sleep increases:
 - obesity, car accidents, sports injuries, depression, attention/focus problems, substance use, poor immunity, etc
- Healthy sleep tools:
 - regular bedtime/wake up time, dim lights, shut off electronics, exercise/sports end 1 ½ hrs before bed
 - STARTING SCHOOL LATER (8:30am) WORKS!!

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Cutting off our children's sleep denies them time to dream, literally and figuratively

Dream sleep (REM) is believed to be **critical** for emotional processing, creativity, and problem solving, as it takes new memories and puts them in context from a **wider** point of view.



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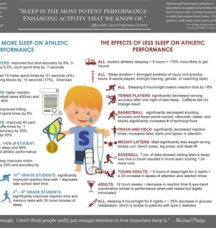
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Questions?

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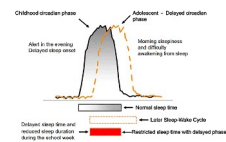


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Sleep - child vs adolescent

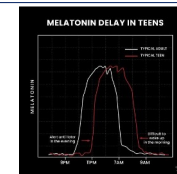


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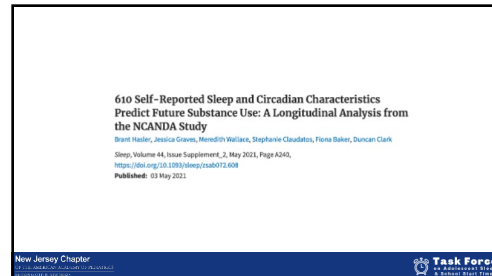
Sleep - adolescent vs adult



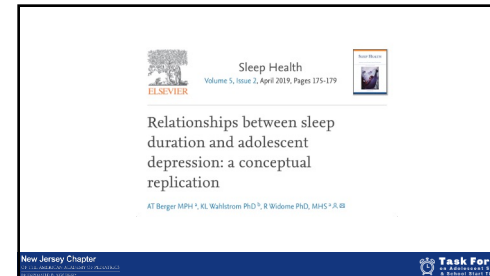
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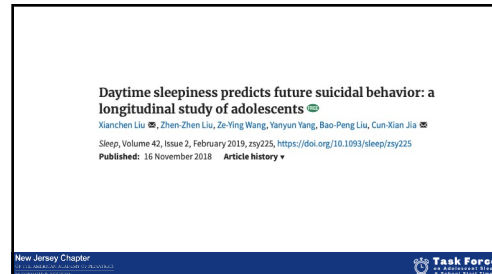
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