HOW TO MASTER YOUR BODY CLOCK

Suzanne Bornschein M.D., F.A.C.P.

-What is the Master Body Clock?
-Where is the Master Body Clock?
-What does it do?
-How do we manage it?
 -How do we transmit that knowledge to our students?
-Naps and Apps

Why do we sleep?

Because we get sleepy

"If sleep doesn't serve an absolutely vital function, it's the greatest mistake ever made."

Allan Rechtschaffen

"The ultimate outcome of prolonged sleep deprivation in animals is death."

Rats deprived of sleep die within 2 to 3 weeks.

Rechtschaffen A, Sleep2002; 25: 18-24

Sleep is organized and controlled

**All animals sleep**

Sleep is encoded in our genes

Sleep is essential for survival

"The sleeping brain isn't stupid…it calculates what to remember and what to forget."

Our brains demand sleep:
-Memory consolidation
-Mood
-General Health-more than 700 genes rely on a solid nights sleep
-Energy
-Performance and productivity
-Creativity
-Problem solving

Master Biological Clock= SCM
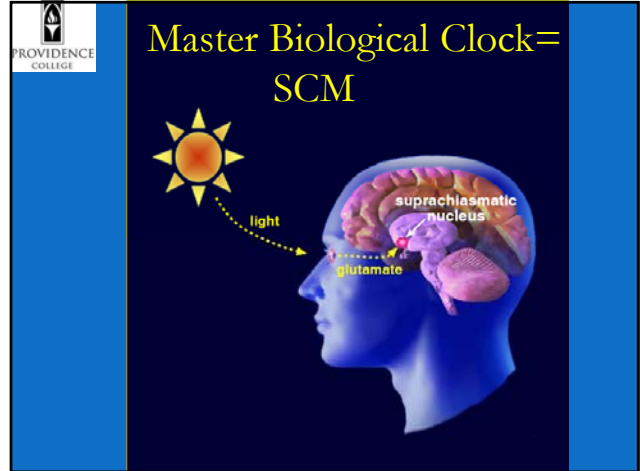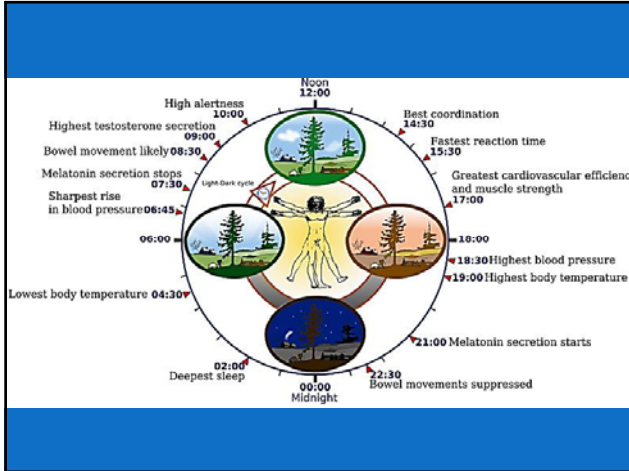
Biological Clock Has 3 Parts

1) Way to receive light/input

2) Clock =20K neurons

3) Clock genes
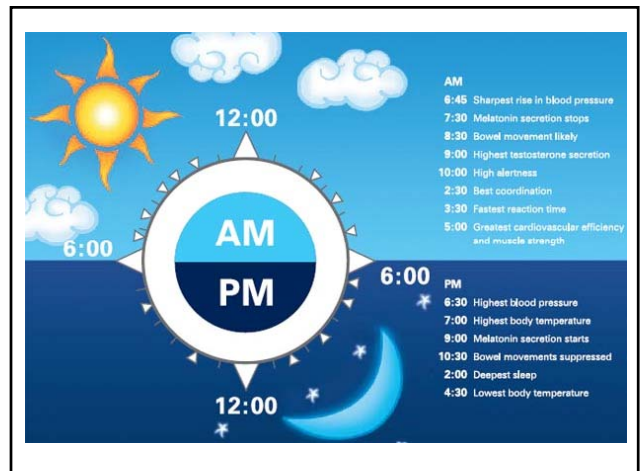
Why Do We Get Sleepy?
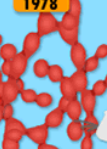
-Circadian timing system: regulated by SCN.
-Homeostatic system:
The longer we are awake, the sleepier we get.

Jet Lag Syndrome=
DE synchronization between body rhythms and environmental rhythms

All nighters = body clock disruption

History of our Understanding of Biological Clocks

Happy Lite

GOLDEN RULE FOR PEAK PERFORMANCE

Know your personal sleep requirements

Dr. J. Maas

Determine Your PSQ:
Personal Sleep Quotient

1) Work off any sleep debt
2) Pick a time when you are sleepy
3) Sleep 8 hours
4) Wake up with an alarm? Add 15 min

Know your chronotype

To Master your Body Clock:

-Manipulate your light input
-Honor your chronotype
-Honor your sleep requirements!

U.S. racks up huge sleep debt

Nearly one-third of Americans regularly get insufficient sleep, according to the American Academy of Sleep Medicine.

2005 to 2008 National Health and
Nutrition Examination Survey

"No, I'M more tired than YOU"

Bragging about how sleep-deprived we are?

new status symbol?

Sleep is for wimps.

We spend a third of our lives asleep

Lean In

- Yet sleep is the basic health need
- we are willing to sacrifice

© UPI Photo / eyevine

Healthy Campus 2020 Goal :

Improving sleep
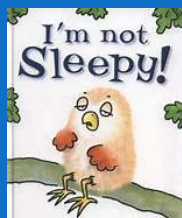
80-90% of chronically sleepy students do not seek help
National College Health Assessment-II
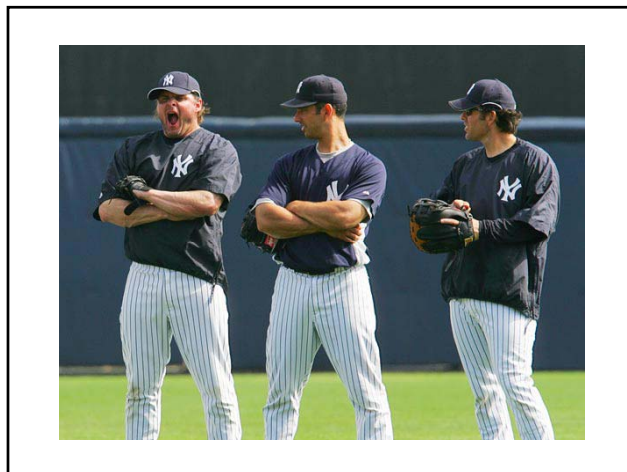
Looking Sleepy Speaks Volumes, Study Says

"other people might treat you differently because of the way you look when you haven't slept,"

Reading facial cues is a highly developed skill.

Based on this skill, people make judgments about whether someone can be trusted or is aggressive or competent

SLEEP
VOLUME 36, ISSUE 09
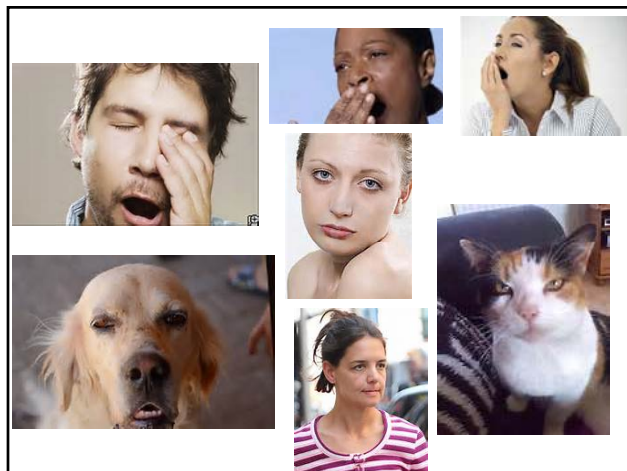
Not getting enough sleep can adversely affect your appetite and weight management.

A. True

B. False

Sleepy People Make Bad Food Choices

Sleep regulates our appetite and fullness

HOURS OF SLEEP	BODY MASS INDEX	LEPTIN	GHRELIN
8 → 5	increases 3.6 %	decreases 15.5 %	increases 14.9 %
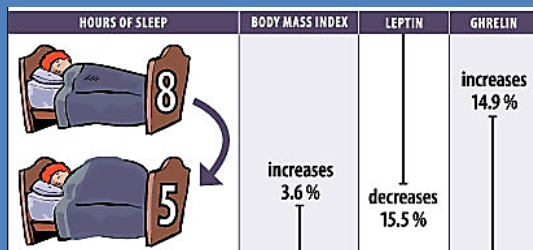
Sleep Deprivation Impact: "perfect storm"

- Hunger

-Decision making: shopping/food purchasing

Sleep habits, more than all other health–related behaviors yielded the highest predictability of academic performance of college students

Troekel MT et al.
J AM Coll Health.2000;49:125-131

Sleep Deprivation suppresses immune system

Increases susceptibility to colds, flu, viral and bacterial infections

Same effect on immune system as stress response

Daytime fatigue

Trouble concentrating

Bad moods

Depression

Poorer sleep quality is associated with lower emotion –regulation ability.

Iris Mauss, Allison Troy
Cognition and Emotion,
2013

DRIVE Study:
 Shorter sleep duration is associated with prevalent and persistent psychological distress in young adults

Glozier,N. Sleep, vol. 33, No 9, 2010

Screen Students Sleep Habits:

-Quantity of sleep
-Quality of sleep
-Daytime naps
-Sleep hygiene: caffeine, etoh
-Light exposure
-All nighters?
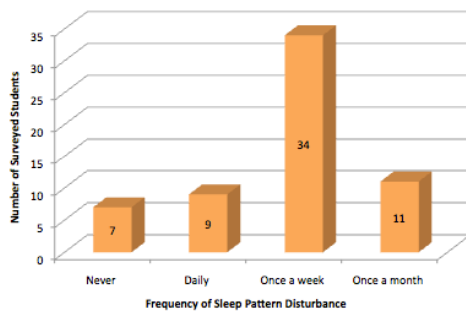
Outside Space Effect on Sleep Pattern
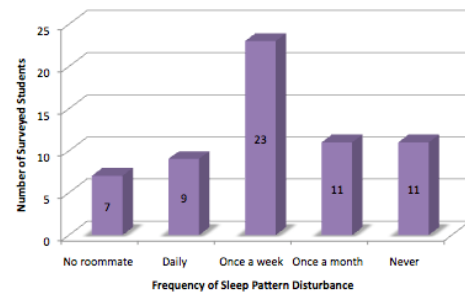
Roommate Effect on Sleep Pattern

Epworth Sleepiness Scale

SITUATION CHANCE OF DOZING
Sitting and reading _____
Watching TV _____
Sitting inactive in a public place (e.g a theater or a meeting) _____
As a passenger in a car for an hour without a break _____
Lying down to rest in the afternoon when circumstances permit _____
Sitting and talking to someone _____
Sitting quietly after a lunch without alcohol
Sitting and reading _____
Watching TV _____
Sitting inactive in a public place (e.g a theater or a meeting) _____
As a passenger in a car for an hour without a break _____
Lying down to rest in the afternoon when circumstances permit _____
Sitting and talking to someone _____
Sitting quietly after a lunch without alcohol

Sleep Diary My Name _____ _____

| MORNING Date →	Date	Date	Date	Date	Date	Date	Date	Date	Date	Date
I went to bed (Give clock time) *please complete the night before*	am / pm	am / pm	am / pm	am / pm	am / pm	am / pm	am / pm	am / pm	am / pm	am / pm
I fell asleep (you can guess, do not watch the clock at night to answer this one)	am / pm	am / pm	am / pm	am / pm	am / pm	am / pm	am / pm	am / pm	am / pm	am / pm
I woke up for the day (Give clock time)	am / pm	am / pm	am / pm	am / pm	am / pm	am / pm	am / pm	am / pm	am / pm	am / pm
I got out of the bed for the day (give clock time)-this may be the same as the time you woke up	am / pm	am / pm	am / pm	am / pm	am / pm	am / pm	am / pm	am / pm	am / pm	am / pm
How many times did you hit the "snooze" button on your alarm?										
How many times did you wake up last night? (number)										
How long were you awake after first falling asleep (minutes)										
How many naps did you take yesterday (number)?										
How long did your naps last (total number of minutes)										
How many caffeinated beverages did you drink yesterday?										
Rate your *Sleep Quality* last night 1. very poor 2. poor 3. OK 4. good 5. very good										
Rate your *Sleep Quantity* last night 1. very inadequate 2. inadequate 3. about right 4. too much										
I woke up *feeling refreshed* 1. no 2. somewhat 3. a little 4. yes 5. Very										
I had any alcohol last night 1. yes 2. No										
On a scale from 1-10, how do you feel this morning? 1 = "so tired I want to go back to bed" 10 = "I woke up feeling great"										
Did you wake up before your alarm today? 1. yes 2. no										
I felt like I was at the right temperature for sleeping last night 1. yes 2. for most of the night 3. for only a small part of the night 4. not at all										

Simple Steps to Improve Your Sleep:

- Use your bed only for sleep and intimacy.
- Turn your bedroom into a sleep inducing environment.
- Go to sleep when you are truly tired

What can I do to help me sleep better?

- Go to bed and get up at the same time each day.
- Get regular exercise each day.
- Nap early or not at all

- Before you go to bed, have a bedtime routine.

-Create a relaxation ritual before bedtime

-Reduce stress by making a to-do list for the next day

-Turn off cell phones/computers

-Reduce light exposure at least 30 min before bedtime.

Increase light exposure when you wake up

What should I avoid to help me sleep better?

- Don't exercise or engage in other stimulating activity just before going to bed.
- Don't read or watch television in bed.
- Avoid caffeine and nicotine.

Time your caffeine + cut down

What should I avoid to help me sleep better?

- Don't use alcohol to help you sleep.
- Don't take another person's sleeping pills.
- Don't lie awake in bed for more than half an hour. Instead get up, do some quiet activity, then return to bed when you are sleepy.

Can't sleep? Read/stretch

-Don't do any activity that rewards you for being awake.

Mastering your body clock=
-Stimulus control
-Sleep hygiene
-Sleep requirements

Napping can make you smarter?

Naps with REM sleep =
Better performance:
creativity-oriented word problem
procedural memory(piano/bike)

How Long to Nap
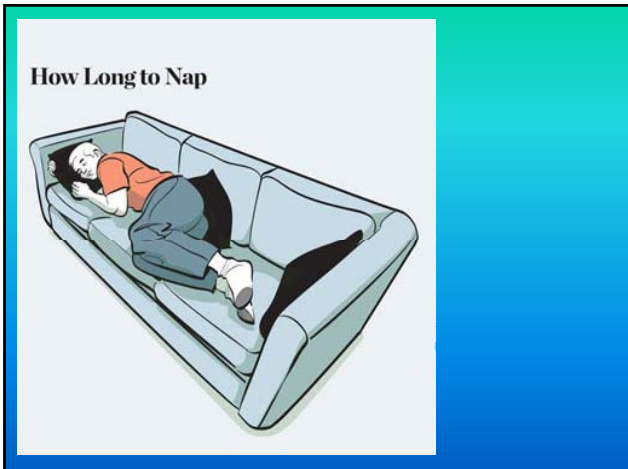
10-20 minute nap: boost in alertness/energy

60 minute nap: best for memory of facts, places, and faces.

 Beware: 30-60 min nap can cause grogginess

Not everyone is built for naps

If naps leave you groggy, a mental time out can be a similar performance booster

Sleep Cycle app

Zeo Sleep Monitor app

FITBIT

http://www.youtube.com/watch?feature=player_embedded&v=oSDzSSJIIE8

Interactive Nap Wheel

•National Sleep Awareness Roundtable
National Sleep Foundation
1010 N. Glebe Road
Suite 310
Arlington, VA 22201

•National Sleep Foundation
1010 N. Glebe Road
Suite 310
Arlington, VA 22201

•Restless Legs Syndrome Foundation
1610 14th St, NW
Suite 400
Rochester, MN 55901
•
  Drowsy Driving
National Sleep Foundation
1010 N. Glebe Road
Suite 310
Arlington, VA 22201

•American Academy of Sleep Medicine
1 Westbrook Corporate Center
Suite 920
Westchester, IL 60154

•American Insomnia Association
1 Westbrook Corporate Center
Suite 920
Westchester, IL 60154

•American Sleep Apnea Association
6856 Eastern Avenue, NW Ste. 203
Washington, DC 20012-211
•Narcolepsy Network, Inc.
P.O. Box 294
Pleasantville, NY 10570

www.sleepfoundation.org
http://healthysleep.med.harvard.edu/healthy/

http://www.apa.org/topics/sleep/why.aspx?item=7

http://www.nsart.org

I want to thank you, Lord, for being close to me so far this day. With your help I haven't been impatient, lost my temper, been grumpy, judgmental, or envious of anyone. But I will be getting out of bed in a minute and I think I will really need your help then. Amen.

PROVIDENCE
COLLEGE

Case 1:

- Female in early 20's
- Falls asleep readily, Weds, Fri, Sat @2:00am
- Reports difficulty falling asleep Sun, Mon, Tues
- Feels anxious about falling asleep
- Falls asleep w/ TV on
- Has tried melatonin, *Tylenol PM* & roommate's pill

Case 2:

- Patient is CEO of large corporation
- Suffers from excessive fatigue/sleepiness during day
- Has difficulty concentrating & performing routine tasks
- Drinks several cups of coffee & *Diet Colas* in afternoon to increase alertness
- Often drinks 1-2 alcoholic beverages before bed
- Sleeps soundly during 1st part of night, then awakens & has difficulty going back to sleep

Case 3:

- 18 yr. old male reports trouble sitting still in class
- Feels tired during day, can't get to sleep at night
- Teachers consider him to be bored, hyperactive & disruptive during class
- Complains he feels as if bugs are crawling under skin on arms and legs

Case 4:

- Patient in early 20's reports no trouble falling asleep
- Suffers multiple awakenings during night, doesn't know why
- Awakens feeling unrefreshed
- Complains of excessive daytime sleepiness
- 6ft tall, weighs 255lbs.
- Roommates report snoring
- Awakens with very dry mouth

2004 AAA Foundation for Traffic Safety found that 9 out of 10 police officers had stopped a driver they believed to be drunk, but turned out to be drowsy instead.

17 hours of sustained wakefulness= BAC level of 0.05% or>
23 hours of sustained wakefulness= 0.10% BAC

Dawson andReid, 1997,
Lamond and Dawson, 1999

20% of MVA's are caused by tired drivers

1 million crashes
50,000 injuries
8000 deaths

JAMA Pediatrics,
online, May20, 2013

23 November 2011 News Mental health worker dies in car crash after ten-hour night shift

.   Nursing Standard: 23 November 2011 Standard. 26, 12, 9-9

LIBBY ZION
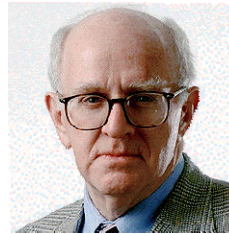
FAA   September 2010 Addresses Pilot Fatigue:

Flight time limits 8-9 hours
10 hour minimum rest periods
Cumulative flight duty/time limits
Fatigue risk management training

Too little sleep – higher mortality

Dysglycemia- Diabetes mellitus type 2
Systemic inflammation
Hypertension
Atherosclerosis- cardiovascular events: stroke and heart attack
Obesity

"Robbing yourself of even an hour or two of sleep a night can radically alter more than 700 genes in your body responsible for repairing tissues and cells"

Proceedings of the National Academy of Sciences   March 2013

Breast cancer ⬆ with night shift work

Blind women ⬇ risk breast cancer

Electronics Before Bed?

2010-36 studies showing excessive media use: shorter sleep time and delayed sleep
1 hour of iPad use is ok

Alcohol helps you sleep.

A. True
B. False

Cognitive Behavioral Therapy for chronic insomnia?

"As effective if not better than prescription sleep medicine"

When to refer to a sleep specialist?

If narcolepsy or sleep apnea is suspected

Proper Circadian Rhythm?

What Surveyed PC Students Say

To function best, you need to get 8 hours of sleep.

What Surveyed PC Students Say

Not getting enough sleep can adversely affect your appetite and weight management.

What Surveyed PC Students Say

If you can't fall asleep, stay in bed longer.

Number of Surveyed Students
45
40
35
30
25
20
15
10
5
0

True 20%   False 80%
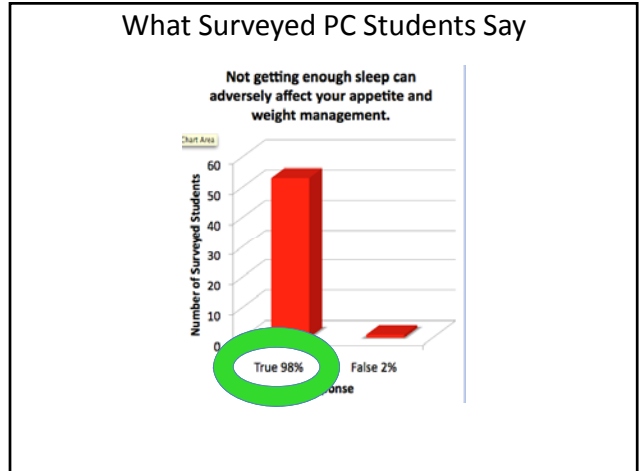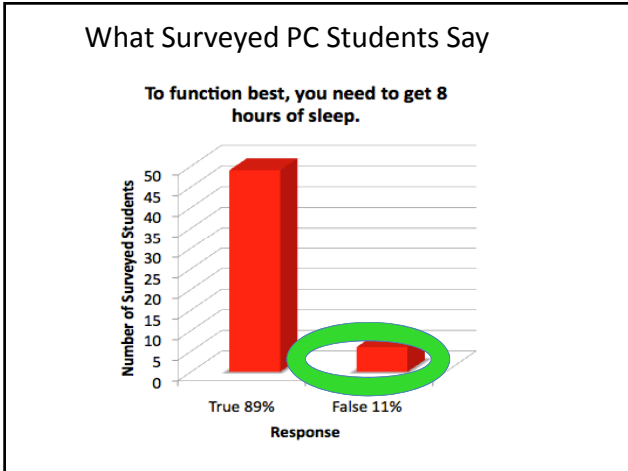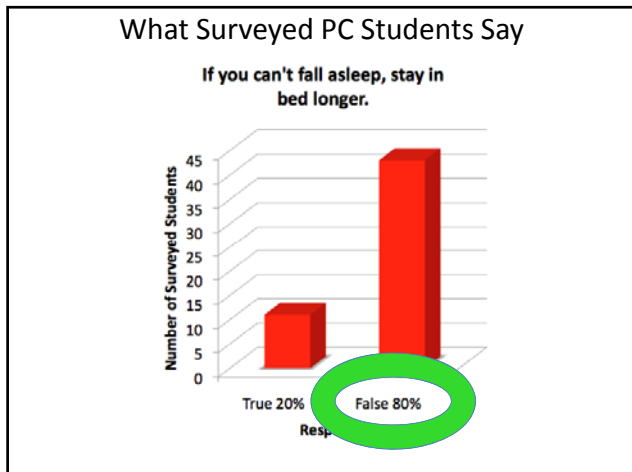
Some people function perfectly on four hours of sleep.

A. True
B. False

What Surveyed PC Students Say

Some people function perfectly on four hours of sleep.

Number of Surveyed Respondents
35
30
25
20
15
10
5
0

True 42%   False 58%

What Surveyed PC Students Say

Alcohol helps you sleep.

Number of Surveyed Students
45
40
35
30
25
20
15
10
5
0

True 17%   False 83%
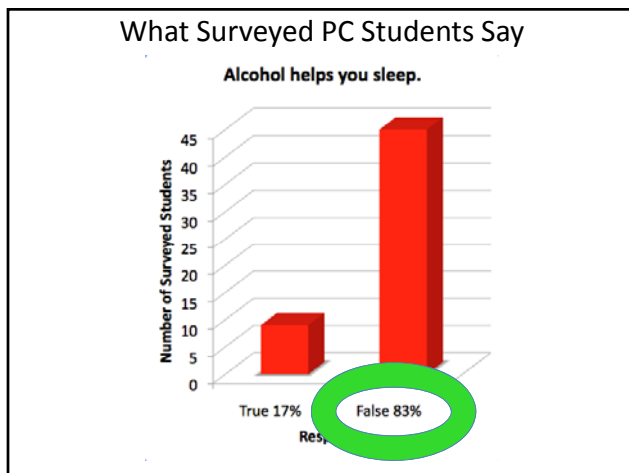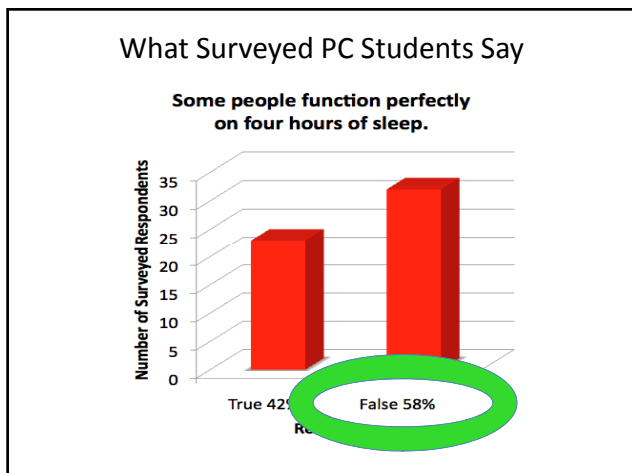
THE STATE OF STUDENT SLEEP

A discussion of sleep habits among undergraduates
By: Caroline Y. Doyle, B.A.

SLEEP

WHY do we need sleep?

Sleep quality….

- A loosely defined, but ubiquitously used construct
  - can be defined as:
    - tiredness on waking
    - level of daytime sleepiness
    - feeling rested on waking
    - and/or number of awakenings throughout the night

(Harvey et al, 2008)

The Importance of Sleep

- Insufficient sleep increases likelihood of developing diseases such as…
  - stroke, heart attack, hypertension, depression, obesity and diabetes (Colten and Altevogt, 2006).

- Sleep quality impacts physical and mental health (Tanaka, et al 2002; Lund, et al 2010)

The Importance of Sleep

□ Sleep has been shown to be a factor that affects the following in **college students:**

□ academic performance (Gaultney, 2010; Arnold, 2012)

□ depression and anxiety (Nyer, et al, 2013)

□ Mood (Milner and Cote, 2009; Settineri, et al, 2012)

Sleep and College Students

College students get about 6-7 hours of sleep per night
(Lund et al, 2010)

27% of students surveyed were at risk for a sleep disorder (Gaultney, 2010).

□ Those with GPA's <2.0 were overrepresented in this group

Sleep and College Students

□ **Students wake up about 2 hours LATER on weekends, on average** (Lund et al, 2010)

Social jet lag- The discrepancy between social and biological time, between work and free days (Wittmann et al, 2006)

Q: How big an issue is sleep for college students?

□ WELL… According to the National College Health Association Fall 2012 survey of 28,237 undergraduates…

□ **24.9%** reported difficulty handling sleeping issues

□ **19.7%** reported sleep as a factor that affected their academic performance in some way

□ **73.4%** reported that their college/university did not provide them with any information on sleeping difficulties

(American College Health Association, 2012).

Q: How big an issue is sleep for college students?

- **Sleep latency:** time it takes to fall asleep
  - Associated with d/o's like insomnia and depression

    - Caffeine and cigarette use is associated with longer sleep latency in college students (Lemma et al, 2012)
    - ~20% reported sleep latency of >1 hour (Sweileh et al, 2011)

A word about *naps*

- **A short 20-30 minute nap can improve mood, alertness, and performance** (NSF, 2011).

  - Most students **don't** nap for the recommended 30 minutes
  - *Sleep inertia* is associated with long naps (>30 mins)
  - Naps decrease our *sleep pressure:* our urge to sleep (Crowley et al., 2007)

Sleep Differences Among Class Years

- Most differences seem to be between **freshmen** and **non-freshmen** in college
  - Freshman year = most demanding d/t many new experiences (Maggs, 1997)

- Freshmen go to bed and wake up *later* than juniors and seniors in college (Lund et al., 2010)
- Freshmen have *shorter* sleep time than other students on weekdays (Tsai et al., 2004)

Sleep Differences Between Genders

- Females tend to report *more* sleep disorders than males (Tsai et al, 2004; Buysse et al, 2008)

- Females tend to go to bed and wake up *earlier* than males (Tsai et al, 2004; Sweileh et al, 2012)

- Gender seems to influence 'chronotype distribution', but not actual sleep time-duration (Lehnkering and Siegmund, 2007)

The purpose of this research was to examine the following hypotheses:

Average hours of sleep during the week would be around 7 hours

More than 1/3 of the sample will report a sleep latency of 30 minutes or higher

Average bed times and rise times would be delayed on the weekends compared to weekdays

The purpose of this research was to examine the following hypotheses:

Males would have later bed times and rise times than females

Freshmen would have earlier rise times on weekdays compared to all other years

Freshmen would have shorter sleep duration than other grades

…and to *explore* the following:

How informed are students about sleep fact vs. myth?

Will students who nap go to bed later and take longer to fall asleep than non-nappers?

What are the common sleep habits among students?

Are students listening to their body clocks?

Participants

Table 1: Survey respondent characteristics N= 158		
Class year:		(%)
Freshmen	35.7	
Sophomores	22.3	
Juniors	17.8	
Seniors	24.2	
Gender :		(%)
Male	26.8	
Female	71.9	
mean age, in years (SD):		19.83 (1.24)

- All undergraduates at PC during the 2013 spring semester
- 163 participants took the survey; 158 had complete data

Method

- A random sample of 300 undergraduates at PC were recruited to take the online survey via blast email.
- Additional ppts were recruited through Facebook
- Survey parts:
  - #'s 1-10: sleep knowledge, (adapted from the NIH Office of Science Education sleep knowledge questionnaire)
  - #'s 11-14: sleep hygiene (adapted from Wofford College Wellness Center sleep survey)
  - #'s15-29 sleep habits (adapted from the USC School of Medicine patient sleep questionnaire)
- Survey was available online for about 1 month

Statistical Analyses

- Basic descriptive statistics were conducted
- Independent samples t-tests were utilized to analyze differences in bed times, rise times, and mean hours of sleep between…
  - males and females
  - freshmen and upperclassmen
  - Nappers and non-nappers

Results: Sleep Knowledge

- 10 T or F questions pertaining to sleep facts (NIH Office of Science Education)
- High %-age of students answered following 3 q's incorrectly:
  - 'Does drinking coffee cure drowsiness?'
    - (47% agreed, but the answer is **NO**)
  - 'Does driving makes you sleepy?'
    - (56% agreed but the answer is **NO**)
  - 'Is sleep the time for the body and brain to shut down for rest?'
    - (84% agreed but the answer is **NO**).

Results: Sleep Hygiene

Table 1. Percentages and frequencies of sleep habits, (N=154)		
I usually make up for lost sleep by:		n
sleeping late on weekends	**34.4%**	53
living with less sleep	27.9%	43
drinking caffeine	27.3%	42
adjusting my schedule	10.4%	16

Results: Sleep Hygiene

Table 2. Percentages and frequencies of sleep habits, (N=154)		
I am most likely to "blow off" sleep in order to:		n
study	59.1%	91
Other (e.g. work, party)	20.1%	31
hang out with friends	17.5%	27
I do not 'blow off' sleep	3.2%	5

Results: Sleep Hygiene

Table 3. Percentages and frequencies of sleep habits, (N=154)		
If I become sleepy while studying, I am most likely to:		n
take a short break	34.4%	53
drink a caffeinated drink	27.9%	43
take a nap	24.0%	37
keep studying at all costs	10.4%	16
start studying something else	3.2%	5

Results: Sleep Habits

Table 4. Sleep patterns of whole sample (N=154)	average bed time (SD)	average rise time (SD)	average total sleep time (SD)
Week: Mean (SD)	12:41 AM (63 mins)	8:23 AM (65 mins)	**7 hours and 41 mins** (72 mins)
Weekend: Mean (SD)	2:17 AM (56 mins)	10:44 AM (82 mins)	**8 hours and 27 mins** (72 mins)
Difference between wkday and wkend times:	1 hour and 36 mins	2 hours and 21 mins	46 mins

Results: Average Hours Asleep per Night by Gender

Table 5. Average hours asleep per night (N= 154)			
Gender:	Male	Female	P value
N:	40	114	
average hours asleep-weekend (SD):	8 hours and 28 mins (100 mins)	8 hours and 27 mins (64 mins)	.964
average hours asleep-week (SD):	7 hours and 33 mins (80 mins)	7 hours and 44 mins (69 mins)	.397

No significant differences in hours asleep per night between males and females
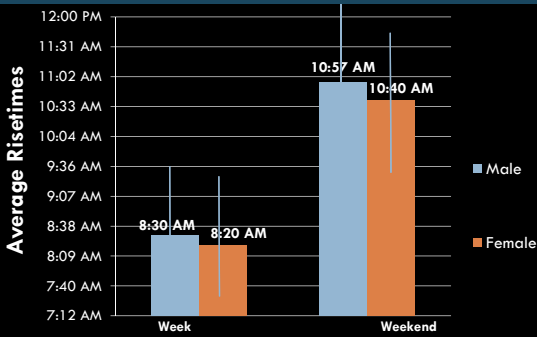
Results: Gender Differences

Figure 1. Differences in rise times between males and females.
No significant differences between week and weekend rise times for males and females (p=.402, p=.249)

Results: Gender Differences
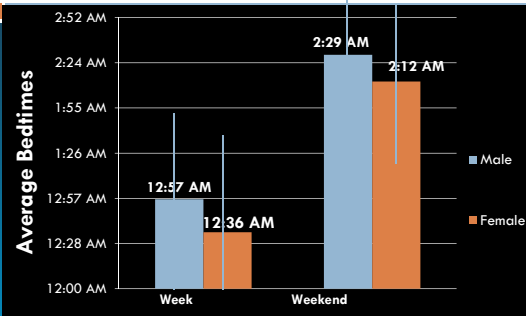

Figure 2. Differences in bed times between males and females.
Difference in weekday bedtime had a trend toward significance (p=.06); Difference in weekend bedtime was not statistical significant (p=.102)

Results: Class Differences

Table 6. Sleep habits of freshmen and all other class years

	N	Average **hours asleep** during week (SD)	Average **rise time** during week (SD)	Average **bed time** during the week (SD)
Freshmen	55	7 hours and 28 mins (80 mins)	8:13 AM (63 mins)	12:45 AM (65 mins)
Non-freshmen	99	7 hours and 48 mins (67 mins)	8:28 AM (65 mins)	12:40 AM (61 mins)
p value		p=.090	p=.149	p=.653

- **No significant differences in weekday times between freshman and other grades, but trend towards significance in hours asleep during week between freshmen and non-freshmen**

Results: Naps

Table 4. Characteristics of nappers and non-nappers (N=153)

	0 naps per week	more than 1 nap per week	p value
	(n=52)	(n=101)	
Frequency of napping	34%	66%	
Average weekday bedtime (SD)	12:28 AM (66 mins)	12:49 AM (61 mins)	p=0.052
Average weekend bedtime (SD)	2:08 AM (53 mins)	2:21 AM (57 mins)	p=0.149
	(n=48)	(n=93)	
Sleep latency (SD)	30 minutes (21 mins)	30 minutes (23 mins)	p=0.961

- No significant differences between characteristics of nappers and non-nappers.
- Additionally, the majority of napping participants (61.7%) reported feeling groggy or sleepy after taking a nap, as opposed to refreshed.

Results: All-Nighter Culture

Q: What was the average *earliest* time in the past 2 weeks students had gone to bed?

A: **11:35 PM** (SD of 1 hour and 7 minutes)

Q: What was the average *latest* time in the past 2 weeks students had gone to bed?

A: **2:35 AM** (SD of 1 hour and 27 minutes)

- 6% of respondents reporting <u>4:30am</u> as their latest bedtime in 2 weeks

Results: The Body Clock

- Average amount of time between alarm clock wake up and when one would naturally wake up:
  - **1 hour and 33 minutes (SD of 77 mins)**

- Average hours of sleep students think they'd feel their best:
  - **9 hours and 35 minutes, (SD 76 minutes)**

- The average time one 'starts feeling tired at':
  - **10:05 PM (SD of 116 mins)**

- Discrepancy between avg weekday bedtime and avg time one starts feeling tired:
  - **<u>2 hours and 35 minutes</u>**

Discussion

- Results cannot be generalized to all college students, nor to all PC students
- Despite this, I found some of the same trends researchers with much larger sample sizes have found:
  - E.g.:
    - There was a trend towards significance in the following:
      - females went to bed and rose earlier than males during the week
      - Nappers went to bed later than non-nappers
    - Average hours of sleep during the week was around 7 hours
    - Bed times and rise times were delayed on the weekends

(Tsai et al, 2004; Sweileh et al, 2012; Lehnkering and Siegmund, 2007; Pilcher et al, 2001; Lund et al, 2010; Yen, et al, 2010; Lund et al., 2010; Chung & Cheung, 2008

Discussion

- Number of null findings that contradicted the literature:
  - Freshmen did NOT have earlier rise times on weekdays compared to all other years
  - Freshmen did NOT have shorter sleep duration than other grades

Discussion: Exploratory findings

- **Sleep knowledge** questions that the majority of students answered incorrectly

- **Sleep hygiene**: Many students reported blowing off sleep in order to study… counterproductive?

- **Body clock**: students don't seem to be listening to it

Limitations

- Survey measures were modified from standardized measures
- Females were overrepresented
- Small sample size
- Data was self report, not objective
- Some demographic information (i.e. race/ethnicity) was not collected

Conclusion: What Should Our Goals Be?

1. Stress the importance of sleep to college students
2. Aim to help students practice healthy sleep behaviors
   - E.g.: sleeping for ~8 hours a night
3. Changing common knowledge
4. And in doing so, chip away at the all-nighter culture on campus

How Do We Effectively Deliver This Information?

Campus Sleep Campaigns

☐ A number of professionals have recommended the implementation of sleep quality monitoring and sleep hygiene education for college students (Lund, et al, 2010; Marhefka, 2011).

☐ Some universities have done so:
  ☐ E.g. University of Arizona launched a campus-wide media intervention for better student sleep
    ◼ Helped reportedly **10%** of the student pop. find better ways to sleep (Orzech, Salafsky, & Hamilton, 2011).
  ☐ More:
    ◼ E.g., Tufts, UPenn, and U of Missouri-Kansas City, University of California at Davis

☐ Examples of what some universities have done to help students with sleep
(Source: http://www.bestcollegesonline.com/blog/2012/09/21/13-colleges-creatively-combating-student-sleep-problems/)

Discussion: Moving Forward

☐ Received a grant from NECHA to institute a campus-wide infographic sleep intervention
☐ 2 parts:
  ☐ randomized controlled trial with 4 undergraduate dorms on campus
  ☐ Campus-wide sleep campaign will occur in the spring during National Sleep Awareness Week

☐ Wish us luck and see you this time next year!

A special thanks to Suzanne Bornschein, M.D., the Student Health Center at Providence College, and Tricia Leahey, Ph.D.

References

- Harvey AG, Stinson K, Whitaker KL, Moskovitz D, Virk H. The subjective meaning of sleep quality: a comparison of individuals with and without insomnia. SLEEP 2008;31(3):383-393.
- Colten, H. R., & Altevogt, B. M. (Eds.). (2006). Sleep disorders and sleep deprivation: an unmet public health problem. National Academies Press.
- Tanaka, H., Taira, K., Arakawa, M., Masuda, A., Yamamoto, Y., Komoda, Y., ... & Shirakawa, S. (2002). An examination of sleep health, lifestyle and mental health in junior high school students. Psychiatry and Clinical Neurosciences, 56(3), 235-236.
- Lund, H. G., Reider, B. D., Whiting, A. B., & Prichard, J. R. (2010). Sleep patterns and predictors of disturbed sleep in a large population of college students. Journal of Adolescent Health, 46(2), 124-132.
- Gaultney, J. F. (2010). The prevalence of sleep disorders in college students: impact on academic performance. Journal of American College Health, 59(2), 91-97.
- Arnold, O. R. (2012). Nothing to Yawn at: A Study Assessing the Importance of Sleep Habits for Academic Student Success (Doctoral dissertation, Youngstown State University).
- Nyer, M., Farabaugh, A., Fehling, K., Soskin, D., Holt, D., Papakostas, G. I., ... & Mischoulon, D. (2013). RELATIONSHIP BETWEEN SLEEP DISTURBANCE AND DEPRESSION, ANXIETY, AND FUNCTIONING IN COLLEGE STUDENTS. Depression and anxiety.
- Milner, C. E., & Cote, K. A. (2009). Benefits of napping in healthy adults: impact of nap length, time of day, age, and experience with napping. Journal of Sleep Research, 18(2), 272-281.
- Settineri, S., Gitto, L., Conte, F., Fanara, G., Mallamace, D., Mento, C., ... & Bramanti, P. (2012). Mood and sleep problems in adolescents and young adults: an econometric analysis. The journal of mental health policy and economics, 15(1), 23.
- Wittmann, M., Dinich, J., Merrow, M., & Roenneberg, T. (2006). Social jetlag: misalignment of biological and social time. Chronobiology international, 23(1-2), 497-509.
- American College Health Association, 2012).
- Lemma, S., Patel, S. V., Tarekegn, Y. A., Tadesse, M. G., Berhane, Y., Gelaye, B., & Williams, M. A. (2012). The Epidemiology of Sleep Quality, Sleep Patterns, Consumption of Caffeinated Beverages, and Khat Use among Ethiopian College Students. Sleep disorders, 2012.
- Sweileh, W. M., Ali, I. A., Sawalha, A. F., Abu-Taha, A. S., Zyoud, S. E. H., & Al-Jabi, S. W. (2011). Sleep habits and sleep problems among Palestinian students. Child Adolesc Psychiatry Ment Health, 5(1), 25.
- National Sleep Foundation, 2011. Napping. http://www.sleepfoundation.org/article/sleep-topics/napping
- Crowley, S. J., Acebo, C., & Carskadon, M. A. (2007). Sleep, circadian rhythms, and delayed phase in adolescence. Sleep medicine, 8(6), 602-612.
- Philip, P., Taillard, J., Moore, N., Delord, S., Valtat, C., Sagaspe, P., & Bioulac, B. (2006). The Effects of Coffee and Napping on Nighttime Highway DrivingA Randomized Trial. Annals of Internal Medicine, 144(11), 785-791.
- Maggs, J. L. 1997. "Alcohol use and binge drinking as goal-directed action during the transition to post-secondary education." In Health risks and developmental transitions during adolescence Edited by: Schulenberg, J. E., Maggs, J. L. and Hurrelmann, K. 345–371. New York, NY: Cambridge University Press..
- Tsai, L. L., & Li, S. P. (2004). Sleep patterns in college students: Gender and grade differences. Journal of Psychosomatic Research, 56(2), 231-237.
- Buysse, D. J., Angst, J., Gamma, A., Ajdacic, V., Eich, D., & Rössler, W. (2008). Prevalence, course, and comorbidity of insomnia and depression in young adults. Sleep, 31(4), 473.
- Sweileh, W. M., Ali, I., Sawalha, A. F., Abu-Taha, A. S., Zyoud, S. E. H., & Al-Jabi, S. W. (2012). Gender differences in sleep habits and sleep-related problems in Arab Palestinian university students.
- Lehnkering, H., & Siegmund, R. (2007). Influence of chronotype, season, and sex of subject on sleep behavior of young adults. Chronobiology international, 24(5), 875-888.
- Pilcher, J. J., Michalowski, K. R., & Carrigan, R. D. (2001). The prevalence of daytime napping and its relationship to nighttime sleep. Behavioral medicine, 27(2), 71-76.
- Yen, C. F., King, B. H., & Tang, T. C. (2010). The association between short and long nocturnal sleep durations and risky behaviours and the moderating factors in Taiwanese adolescents. Psychiatry research, 179(1), 69-74.
- Chung, K. F., & Cheung, M. M. (2008). Sleep-wake patterns and sleep disturbance among Hong Kong Chinese adolescents. Sleep, 31(2), 185.

Epworth Sleepiness Scale

Name: _____ Today's date: _____

Your age (Yrs): _____ Your sex (Male = M, Female = F): _____

How likely are you to doze off or fall asleep in the following situations, in contrast to feeling just tired?

This refers to your usual way of life in recent times.

Even if you haven't done some of these things recently try to work out how they would have affected you.

Use the following scale to choose the **most appropriate number** for each situation:

0 = would **never** doze
1 = **slight chance** of dozing
2 = **moderate chance** of dozing
3 = **high chance** of dozing

It is important that you answer each question as best you can.

Situation   **Chance of Dozing (0-3)**

Sitting and reading   _____   __

Watching TV   _____   __

Sitting, inactive in a public place (e.g. a theatre or a meeting) _____   __

As a passenger in a car for an hour without a break   _____   __

Lying down to rest in the afternoon when circumstances permit _____   __

Sitting and talking to someone _____   __

Sitting quietly after a lunch without alcohol _____   __

In a car, while stopped for a few minutes in the traffic _____   __

THANK YOU FOR YOUR COOPERATION

© M.W. Johns 1990-97

TWO WEEK SLEEP DIARY

INSTRUCTIONS:

1. Write the date, day of the week, and type of day: Work, School, Day Off, or Vacation.
2. Put the letter "C" in the box when you have coffee, cola or tea. Put "M" when you take any medicine. Put "A" when you drink alcohol. Put "E" when you exercise.
3. Put a line (|) to show when you go to bed. Shade in the box that shows when you think you fell asleep.
4. Shade in all the boxes that show when you are asleep at night or when you take a nap during the day.
5. Leave boxes unshaded to show when you wake up at night and when you are awake during the day.

SAMPLE ENTRY BELOW: On a Monday when I worked, I jogged on my lunch break at 1 PM, had a glass of wine with dinner at 6 PM, fell asleep watching TV from 7 to 8 PM, went to bed at 10:30 PM, fell asleep around Midnight, woke up and couldn't got back to sleep at about 4 AM, went back to sleep from 5 to 7 AM, and had coffee and medicine at 7:00 in the morning.

Today's Date	Day of the week	Type of Day Work, School, Off, Vacation	Noon	1PM	2	3	4	5	6PM	7	8	9	10	11PM	Midnight	1AM	2	3	4	5	6AM	7	8	9	10	11AM
sample	Mon.	Work		E					A													C M					

National Sleep Foundation Sleep Diary

	COMPLETE IN MORNING							COMPLETE AT END OF DAY				
Fill out days 1-4 below and days 5-7 on page 2	I went to bed last night at:	I got out of bed this morning at:	Last night, I fell asleep in:	I woke up during the night: *(Record number of times)*	When I woke up for the day, I felt: *(Check one)*	Last night I slept a total of: *(Record number of hours)*	My sleep was disturbed by: *(List any mental, emotional, physical or environmental factors that affected your sleep, e.g. stress, snoring, physical discomfort, temperature)*	I consumed caffeinated drinks in the: *(e.g. coffee, tea, cola)*	I exercised at least 20 minutes in the:	Approximately 2-3 hours before going to bed, I consumed:	Medication(s) I took during the day: *(list name of medication/drug(s))*	About 1 hour before going to sleep, I did the following activity: *(List activity, e.g. watch TV, work, read)*
DAY 1 DAY___ DATE___	___ PM/AM	___ PM/AM	___ Minutes	___ Times	☐ Refreshed ☐ Somewhat refreshed ☐ Fatigued	___ Hours	_____	☐ Morning ☐ Afternoon ☐ Within several hours before going to bed ☐ Not applicable	☐ Morning ☐ Afternoon ☐ Within several hours before going to bed ☐ Not applicable	☐ Alcohol ☐ A heavy meal ☐ Not applicable	_____	_____
DAY 2 DAY___ DATE___	___ PM/AM	___ PM/AM	___ Minutes	___ Times	☐ Refreshed ☐ Somewhat refreshed ☐ Fatigued	___ Hours	_____	☐ Morning ☐ Afternoon ☐ Within several hours before going to bed ☐ Not applicable	☐ Morning ☐ Afternoon ☐ Within several hours before going to bed ☐ Not applicable	☐ Alcohol ☐ A heavy meal ☐ Not applicable	_____	_____
DAY 3 DAY___ DATE___	___ PM/AM	___ PM/AM	___ Minutes	___ Times	☐ Refreshed ☐ Somewhat refreshed ☐ Fatigued	___ Hours	_____	☐ Morning ☐ Afternoon ☐ Within several hours before going to bed ☐ Not applicable	☐ Morning ☐ Afternoon ☐ Within several hours before going to bed ☐ Not applicable	☐ Alcohol ☐ A heavy meal ☐ Not applicable	_____	_____
DAY 4 DAY___ DATE___	___ PM/AM	___ PM/AM	___ Minutes	___ Times	☐ Refreshed ☐ Somewhat refreshed ☐ Fatigued	___ Hours	_____	☐ Morning ☐ Afternoon ☐ Within several hours before going to bed ☐ Not applicable	☐ Morning ☐ Afternoon ☐ Within several hours before going to bed ☐ Not applicable	☐ Alcohol ☐ A heavy meal ☐ Not applicable	_____	_____

National Sleep Foundation Sleep Diary

Fill out days 5-7 below	COMPLETE IN MORNING							COMPLETE AT END OF DAY				
	I went to bed last night at:	I got out of bed this morning at:	Last night, I fell asleep in:	I woke up during the night: *(Record number of times)*	When I woke up for the day, I felt: *(Check one)*	Last night I slept a total of: *(Record number of hours)*	My sleep was disturbed by: *(List any mental, emotional, physical or environmental factors that affected your sleep, e.g. stress, snoring, physical discomfort, temperature)*	I consumed caffeinated drinks in the: *(e.g. coffee, tea, cola)*	I exercised at least 20 minutes in the:	Approximately 2-3 hours before going to bed, I consumed:	Medication(s) I took during the day: *[list name of medication/drug(s)]*	About 1 hour before going to sleep, I did the following activity: *(List activity e.g. watch TV, work, read)*
DAY 5 DAY_____ DATE_____	_____ PM/AM	_____ PM/AM	_____ Minutes	_____ Times	☐ Refreshed ☐ Somewhat refreshed ☐ Fatigued	_____ Hours		☐ Morning ☐ Afternoon ☐ Within several hours before going to bed ☐ Not applicable	☐ Morning ☐ Afternoon ☐ Within several hours before going to bed ☐ Not applicable	☐ Alcohol ☐ A heavy meal ☐ Not applicable		
DAY 6 DAY_____ DATE_____	_____ PM/AM	_____ PM/AM	_____ Minutes	_____ Times	☐ Refreshed ☐ Somewhat refreshed ☐ Fatigued	_____ Hours		☐ Morning ☐ Afternoon ☐ Within several hours before going to bed ☐ Not applicable	☐ Morning ☐ Afternoon ☐ Within several hours before going to bed ☐ Not applicable	☐ Alcohol ☐ A heavy meal ☐ Not applicable		
DAY 7 DAY_____ DATE_____	_____ PM/AM	_____ PM/AM	_____ Minutes	_____ Times	☐ Refreshed ☐ Somewhat refreshed ☐ Fatigued	_____ Hours		☐ Morning ☐ Afternoon ☐ Within several hours before going to bed ☐ Not applicable	☐ Morning ☐ Afternoon ☐ Within several hours before going to bed ☐ Not applicable	☐ Alcohol ☐ A heavy meal ☐ Not applicable		