

Women and Sleep: From Stressful to Restful

11/13/12

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BIOGRAPHY:

Dr. Kathryn A. Lee is a Professor of Nursing in the Department of Family Health Care Nursing at UCSF. She holds the James and Marjorie Livingston Endowed Chair in Nursing and is the Associate Dean for Research in the School of Nursing. She completed her PhD training at University of Washington in 1986 and was a Robert Wood Johnson Clinical Nurse Scholar from 1986-1988. She is board certified in Behavioral Sleep Medicine and an elected Fellow in the American Academy of Nursing. She is a past member of the Sleep Research Advisory Board in the Heart, Lung and Blood Institute at the National Institutes of Health. She is currently an Associate Editor for the journal, *Behavioral Sleep Medicine*, and on the Editorial Board of *Sleep Medicine Reviews*. She has authored over 150 publications related to sleep and women's health.

Dr. Lee has no conflict of interest to declare.

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Women and Sleep: From Stressful to Restful

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Objectives

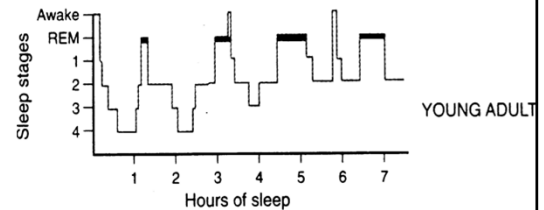
- Describe healthy sleep patterns across the life span.
- Discuss bio-psycho-social health effects of sleep loss.
- Discuss healthy sleep hygiene interventions to improve sleep.

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Sleep Lab Studies



Typical Adult Sleep



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There's no place like home ...

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National Sleep Foundation Polls (1998, 2003, 2007)

- Women report sleeping about 6.5 hrs/night.
- Women report sleeping 8-13 more minutes per night than men, but
- More women (63%) complain about insomnia than men (54%)
- More women (20%) have daytime sleepiness than men (13%)

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Methodology



- Telephone survey of 1,003 American women aged 18-64 living in the US
- 25-minute survey
- Sample is representative of households with a telephone in the US
- Data collected between 9/12/06 and 10/28/06
- Margin of error: +/- 3% (95% CI)

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How do you respond to this warning?



Sleep in America Poll (N=1000 women)

(Baker, Wolfson & Lee, *J Women's Health*, 2010)

- **Working mothers:**
 - **72% complain of insomnia**
 - **Highest caffeine use (56%)**
 - average 2.7 cups/day
 - **Highest rate of drowsy driving (35%)**
- **50-somethings:**
 - **Highest use of sleep aids (41%)**

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Gender Differences

- Is it a biased perception/reporting issue?
- Is it family care/role responsibilities?
- Is it someone else's sleep disorder?
 - sleep apnea in the adult bed partner
 - parasomnias in the child (night terrors)
 - waiting for the phase-delayed teenager to come home at night with the car

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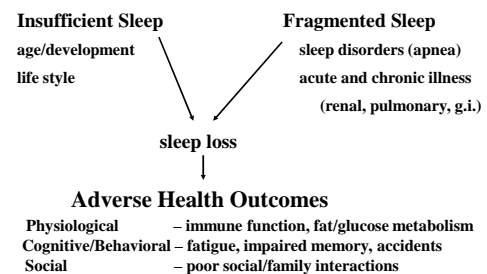
National Sleep Foundation 2007 Women & Sleep Poll

20% are awakened by a child and 9% sleep with children
17% are awakened by a pet and 14% sleep with a pet

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Framework for Sleep Loss and Health

Lee, et al. 2004 *Nsg Outlook*



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Sleep & Immune Function

Sleep deprivation can limit effectiveness of a flu shot:

Flu shots to 2 groups of healthy young men:

- one group - sleep only 4 hrs/night for 4 nights
- other group - slept normally

10 days after vaccination:

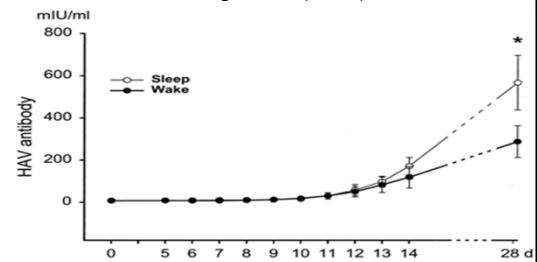
sleep-deprived group produced fewer than half as many flu-fighting antibodies (Spiegel, et al. Effect of sleep deprivation on response to immunization. JAMA, 2002)

- Similar results with hepatitis A vaccination (Lange, et al. Sleep enhances the human antibody response to hepatitis A vaccination. Psychosom Med, 2003)

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Hepatitis A Vaccination

Lange et al (2003)



Open circle - regular sleepers the night after vaccination

Filled circle - kept awake on that night

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Sleep and Pregnancy Outcomes*

Lee & Gay, Obstet Gynecol, 2004

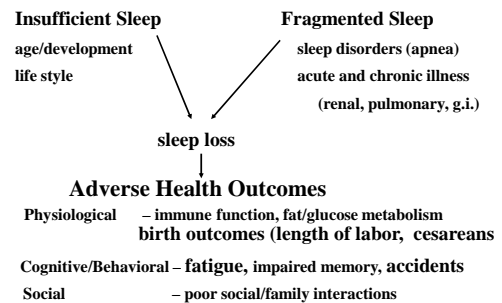
Total Sleep Time	Labor (hrs)	C/S	OR	95% C.I.
7+ hrs (n=74)	17.7 ± 15.6	11%	ref	
6-6.9hrs (n=38)	20.5 ± 11.3	34%	3.67	1.33-10.2 (p=.012)
<6 hrs (n=19)	29.0 ± 12.5	37%	4.54	1.36-15.2 (p=.014)

*controlled for birth weight

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Framework for Sleep Loss and Health

Lee, et al, 2004 Nsg Outlook



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Sleep Loss: Accidents & Errors Costs to Society

- Affects 50-70 million Americans
- Adds \$15 billion to national health care
- IOM - estimates that drowsy driving is responsible for 20% of motor vehicle crashes
 - drowsy driving causes 1 million crashes and 8,000 deaths each year in the U.S.
- 24 hrs of continuous wake induces impaired performance equivalent to a blood-alcohol level of 0.10% (legal limit for alcohol intoxication in the USA is .08%)

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Midlife: Time of Transition

- Midlife = 40-60 years of age
- Some are starting families, others are grandmothers
- Some children have left home, other adult children are returning home (boomerangs)
- Caregiving for spouse or elder family members
- Caring for both children & elders (sandwiches)

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Menopause = estrogen insufficiency

most common symptom
associated with estrogen
insufficiency:
hot flash, flush, night sweat

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Hot Flashes and Sleep

PSG Stage 0

- Peri-menopausal (n=12 no symptoms) 10%
- Peri-menopausal (n=20 symptoms) 13%

Shaver, Giblin, Lentz, & Lee, *Sleep* 1988

- Non-flashers (n= 7) 5%
- Flashers (n= 12) 10%

Woodward & Freedman, *Sleep* 1994

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Hormone Replacement Therapy

HRT in randomized clinical trials:

- No change in sleep stages
- Reduced symptom complaints
- Low incidence of periodic leg movements
- Low incidence of sleep disordered breathing/apnea

Montplaisir, et al 2001 *Menopause: J North American Menopause Soc.*
2 nights PSG baseline and 6 month follow-up; n=21 post-menopausal

Purdie, et al 1995 *Brit J Obstet Gynec.*
12 wks placebo or 12 wks HRT; PSG 1 night every other wk; n=33

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Freedman & Roehrs, *Fertility Sterility* 2004

- Symptomatic group had 5.2 ± 2.9 (1-18) hot flashes/night
- 6 asymptomatic women had hot flashes
- Comparing symptomatic and asymptomatic women 46-51 yrs of age:
 - No differences on sleep (nights 2 & 3)
 - No differences on questionnaires

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San Francisco Longitudinal Midlife Study

- To describe women's sleep over time, from pre-menopause to post-menopause, in relation to bio-psycho-social-cultural factors (every 6 months for 3-4 years):
 - FSH level
 - diet, exercise, smoking, & body weight
 - stress and emotional health
 - family and social relationships

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Co-Investigators

- Yewoubdar Beyene, PhD UCSF Anthropologist
- Catherine Gilliss, RN DNSc Yale Family Health
- Yolanda Gutierrez, PhD, RD UCSF Nutritionist
- John Neuhaus, PhD UCSF Statistician

NIH R01 NR04259
Office of Women's Health Supplement

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Methods

Community-based sample of healthy regularly menstruating women

Live in US at least 20 years

40 - 48 years of age

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Perceived sleep quality not significantly different for:

		<u>PSQI</u>
▪ Women with children	(58%)	5.3 ± 3.2
▪ Women without children	(42%)	4.8 ± 2.7
▪ Employed women	(86%)	5.2 ± 3.0
▪ Unemployed women	(14%)	5.1 ± 3.1
Nocturia or hot flashes		NS
Exercise		NS
Alcohol/caffeine		NS
Low fat diet		NS

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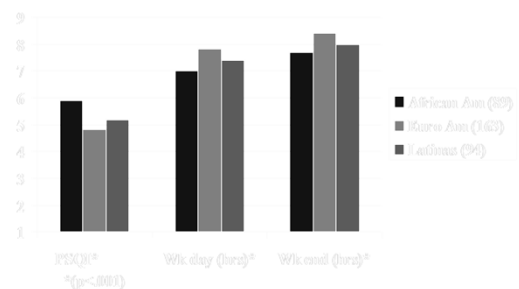
Correlates of Perceived Sleep: Late-Premenopausal Women

Perceived sleep quality was worse for:

		<u>PSQI</u>
▪ Single women	(47%)	5.7 ± 3.1 (p=.005)
▪ Married/Partnered	(53%)	4.8 ± 3.0
▪ Smokers	(22%)	5.7 ± 3.1 (p=.01)
▪ Non-smokers	(78%)	4.8 ± 2.6
▪ African Americans		

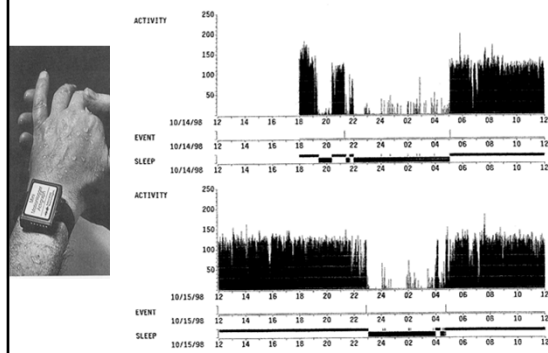
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Late Pre-menopausal Subjective Sleep

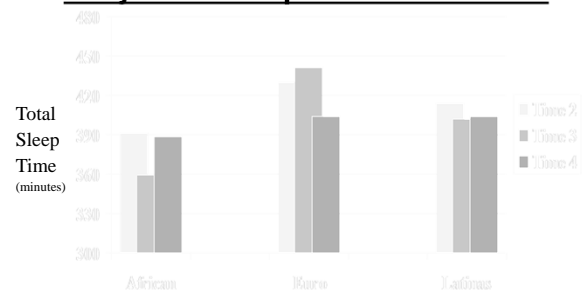


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Actigraphy Example: hot flashes



Late Pre-menopausal Objective Sleep



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A Bio-Psycho-Social Framework for Predicting Sleep Complaints in Midlife Women (n=347)

Biological Factors	1%	
Age/FSH		
Body weight/diet		
Smoking		
Exercise *		
Psychological Factors	30%	→ Sleep
Depression*		
Stress		
Social factors	4%	Complaints
Supportive relations		
Multiple roles (wife, mother, employee)		
Ethnicity*		
Education*		

36% > 5 PSQI

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Summary: Midlife Women

- Little is known about women's sleep in the decade prior to menopause or how sleep is altered during menopausal transition.
- Psycho-social factors may play a larger role than hormones and other physiological factors.
- Women self-report more problems with sleep than men, but objective measures (PSG, actigraphy) are similar.

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What is Sufficient for a Good Night's Sleep???

- The average person needs 7-8 hrs
- Varies considerably from person to person
- Sleep loss of as little as 1.5 hrs can decrease daytime alertness by 33%

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How Much Sleep Do You Need?

- The amount that permits you to be awake, alert, and energetic throughout the day...

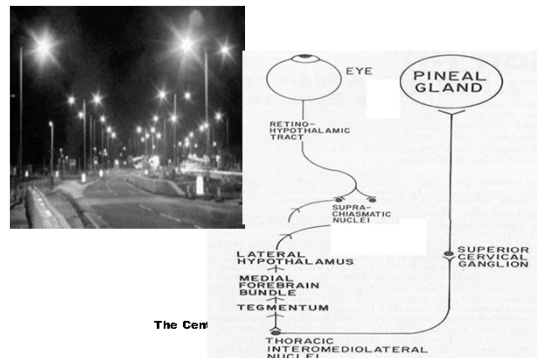
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When to Be Concerned ...

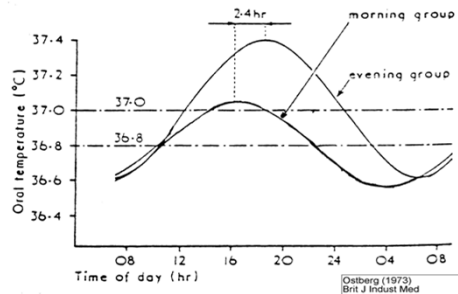
- Longer than 30 minutes to fall asleep on 3 or more nights/week.
- 3 or more awakenings at night.
- Falling asleep during the day.
- Bed partner reports: excessive limb movements, loud snoring or cessation of breathing.

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Pineal Gland and Melatonin



Chrono-type: OWL or LARK?



Sleep in America Poll (N=1000 women)

(Baker, Wolfson & Lee, *J Women's Health*, 2010)

- 50-somethings:
 - Highest use of sleep aids (41%)

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Using Benzodiazepines (sleeping pills)

- facilitate sleep onset and reduce fragmented sleep
- helpful when other remedies are not effective
- can aggravate sleep-related breathing disorders (sleep apnea)
- Only work for a short time
- Can have "hang over" effects

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Sleeping Pills: Benzodiazepines

Side effects include:

- Daytime sleepiness
- Sedation
- Tolerance
- Depression
- Memory impairment

Halcion (Triazolam); Restoril (Temazepam)

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Short-Acting Non-Benzodiazepines

- Ambien (Zolpidem)
- Sonata (Zaleplon)
- Lunesta/Estorra (Eszopiclone)
- Rozerem
 - targets melatonin receptors in the brain

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Replace those sleeping pills with...

Sleep Hygiene

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Sleep Hygiene: Sleeping **B. E. T. T. E. R.**

B. Bedroom

- Comfortable bed
- Safe/secure room
- Cool rather than warm
- Dark rather than light

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B. E. T. T. E. R.

E. Eating

- A protein snack in the evening
- Avoid caffeine, especially within 4-6 hrs of bedtime
- Avoid alcohol, especially before bedtime

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B. E. T. T. E. R.

T. Tension

- Relax prior to sleep
 - Soothing warm milk
 - Warm bath
 - Good book

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B. E. T. T. E. R.

T. Time in bed trying to sleep

- If you can't get to sleep, get up and go somewhere else
- If you wake up early, get up and get going

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B. E. T. T. E. R.

E. Exercise

- Have some type of physical activity in the morning or afternoon
- Avoid heavy physical activity 2-3 hours before bed

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B. E. T. T. E. R.

R. Rhythm

- Keep a consistent daily rhythm for
 - Eating
 - Social activities
 - Sleeping
 - Light exposure

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Healthy People 2020 National Objectives

Provides 10-yr US objectives for promoting health and preventing disease. Proposed objectives that pertain to sleep and sleep disorders:

- Increase proportion of teens obtaining adequate sleep
- Increase proportion of adults obtaining adequate sleep
- Decrease number of motor vehicle incidents attributed to drowsy driving
- Increase the proportion of adults with apnea symptoms seeking medical treatment

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Questions????

NATIONAL SLEEP FOUNDATION

www.sleepfoundation.org

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