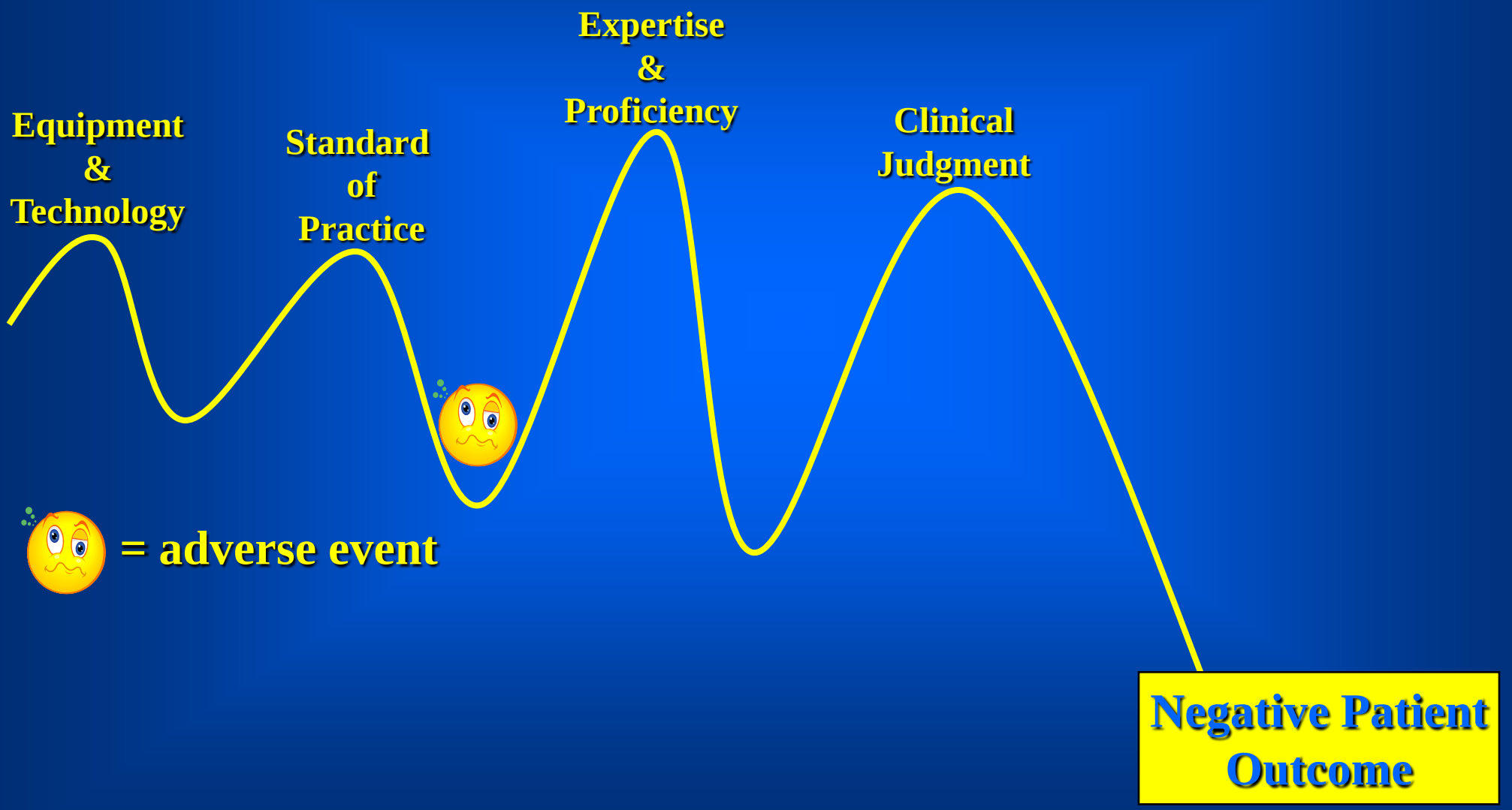
Are Sleepy Providers Keeping Patients Asleep?

Time for a wake-up call?

The National Sleep Study of Nurse Anesthetists

C Biddle CRNA, PhD
Virginia Commonwealth University

Roller-ball model of patient safety



The effect of *fatigue* on the roller-ball model

Equipment & Technology

Standard of Practice

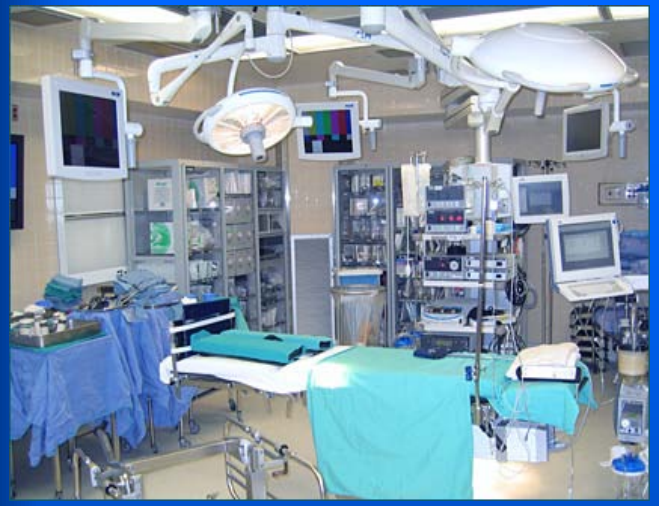
Expertise & Proficiency

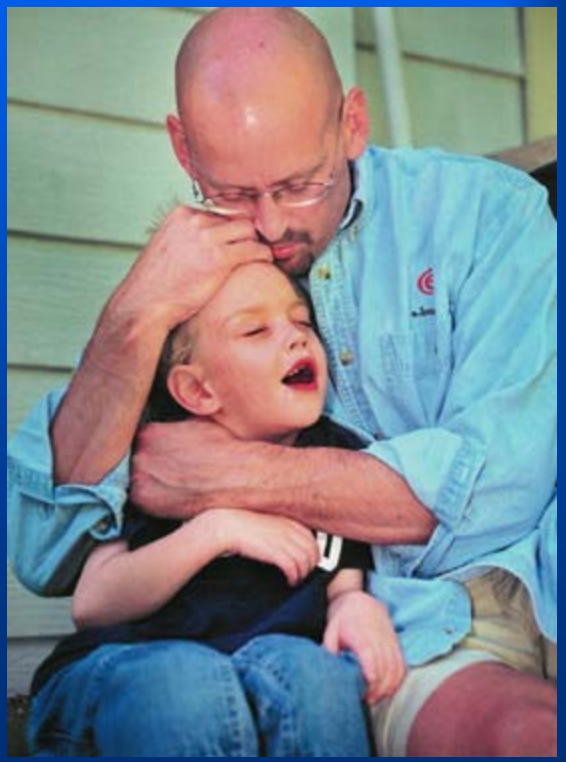
Clinical Judgment

Negative Patient Outcome

 = adverse event

Putting a ‘Face’ on Patient Safety





In Denver, an 8-year-old boy died during routine ear surgery when his anesthesia provider fell asleep and failed to monitor the boy's status. The provider fell asleep during surgeries numerous times before but was never adequately disciplined.

In May 2009 XXX was convicted of manslaughter in the death of a toddler, sentenced to 8 years in prison. YYY was 3 when she died during strabismus surgery after XXX induced general anesthesia and intentionally disabled all alarm monitors. The Judge stated ,"The defendant effectively went to sleep during the surgery without concern."

Doctors, nurses fighting fatigue

TORY SHEPHERD | The Advertiser | September 09, 2009 12:01am | 43 comments

MOONLIGHTING doctors are so exhausted from excessive workloads they are risking patients' lives, experts say.

Sleep expert Professor Drew Dawson says doctors and nurses often work extra shifts and their fatigue is not being monitored or managed adequately.

Australian Medical Association state president Dr Andrew Lavender agreed there was an ongoing concern about docto
potentially compromising pati

Healthcare workers can work
workplace and can switch bet
the money, or because workf

Doctor Falls Asleep During Surgery

Board Revokes License

Email Print

Recommend

SHARE

POSTED: 5:44 am EDT July 26, 2007
UPDATED: 9:49 am EDT July 26, 2007

BOSTON -- A former : who fell asleep in the operating room must prove he's clean before practicing medicine again.

admitted to falling asleep during surgery in December 2005 after taking a prescribed medication. admitted that he "was under a great deal of personal stress," the state said in its complaint against him.

He also said he inhaled Isoflurane, an anesthetic, during his lunch break in January 2006 because he was having a panic attack and "felt he was going to die."

Why do we sleep?

Restorative: Body rejuvenates
Growth hormone released
Melatonin released
Immune system boosted
Memory organization

Sleep is absolutely vital to biology & psychology

Deprivation → significant global impairment

Deprivation → immune system effects

Dr. W.C. Dement: *"Father of Modern Sleep Research"*

50+ years of work
Co-discoverer REM sleep
EEG study sleep
Pioneered Dx/Rx sleep disorders

When asked, *why do we sleep*?

"As far as I know the only solid reason we need to sleep is because we get sleepy."

" Drowsiness is a red flag!! "

Sleep-related fatigue

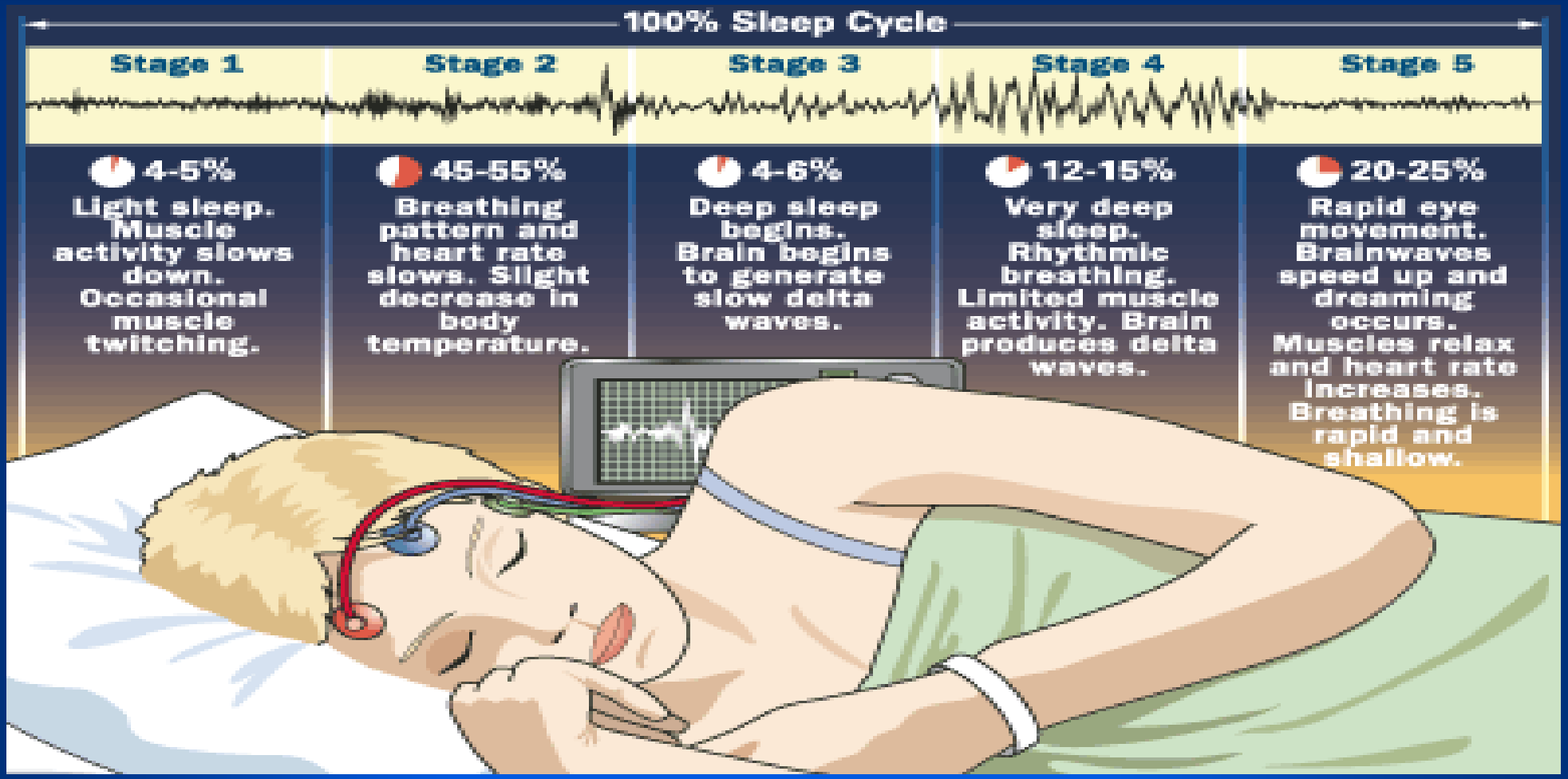
Global cognitive dysfunction

Impaired vigilance

Decay in problem solving ability

Decrement in memory retrieval

Eroded motivation

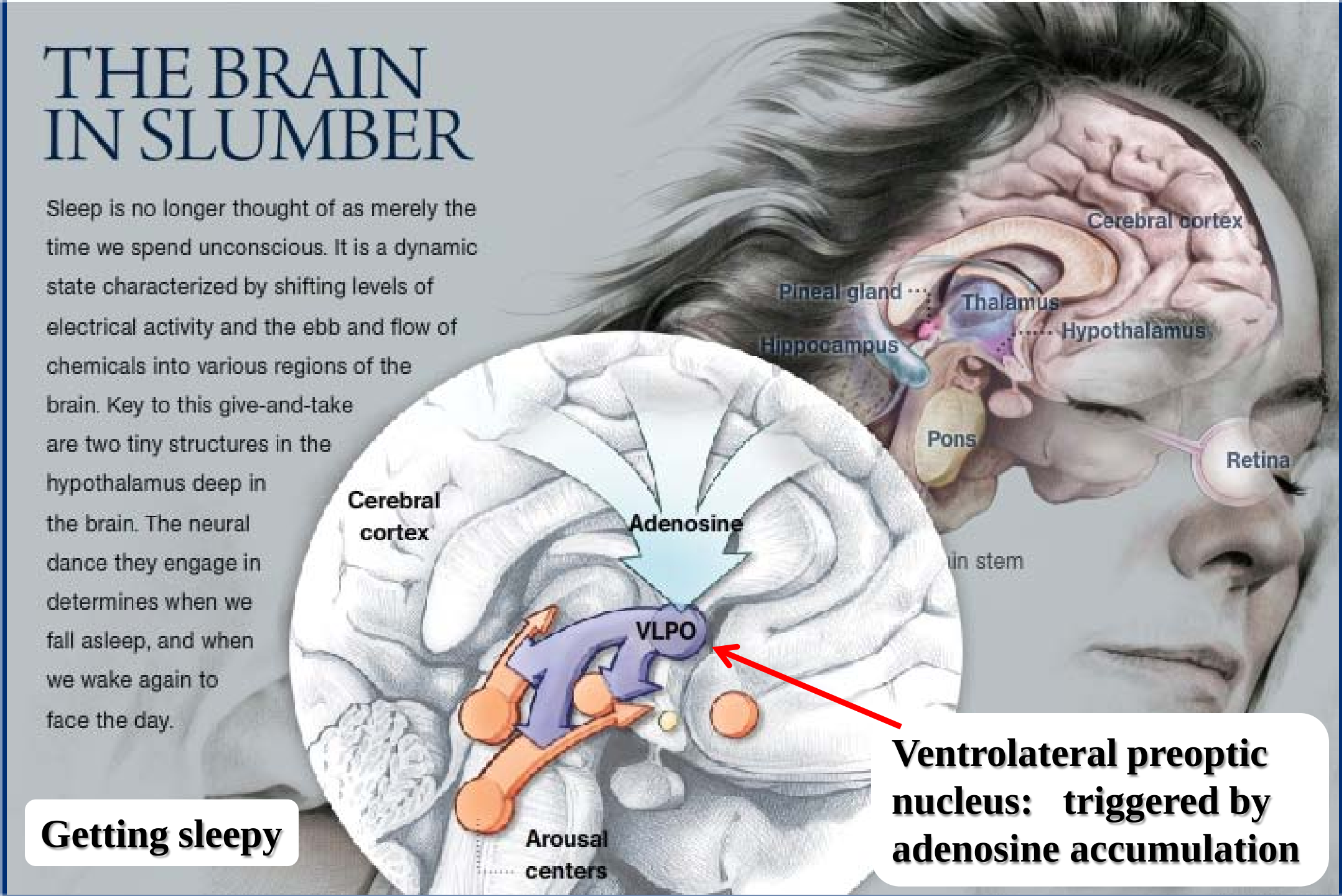


We miss it, if we don't have it

No matter how hard we try to resist it, it conquers us in the end

THE BRAIN IN SLUMBER

Sleep is no longer thought of as merely the time we spend unconscious. It is a dynamic state characterized by shifting levels of electrical activity and the ebb and flow of chemicals into various regions of the brain. Key to this give-and-take are two tiny structures in the hypothalamus deep in the brain. The neural dance they engage in determines when we fall asleep, and when we wake again to face the day.



Getting sleepy

Ventrolateral preoptic nucleus: triggered by adenosine accumulation

THE BRAIN IN SLUMBER

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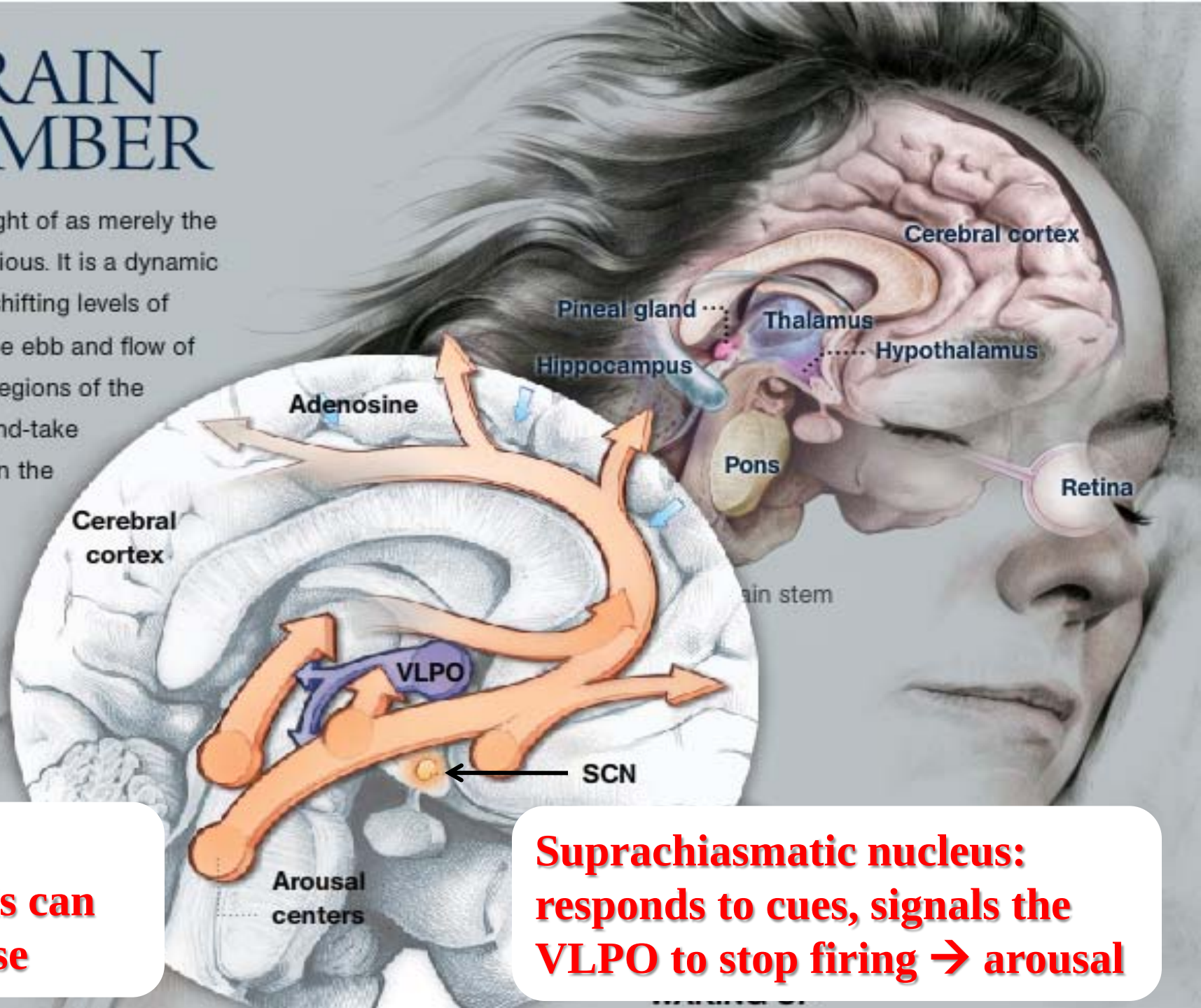


Waking up: multiple signals can initiate response

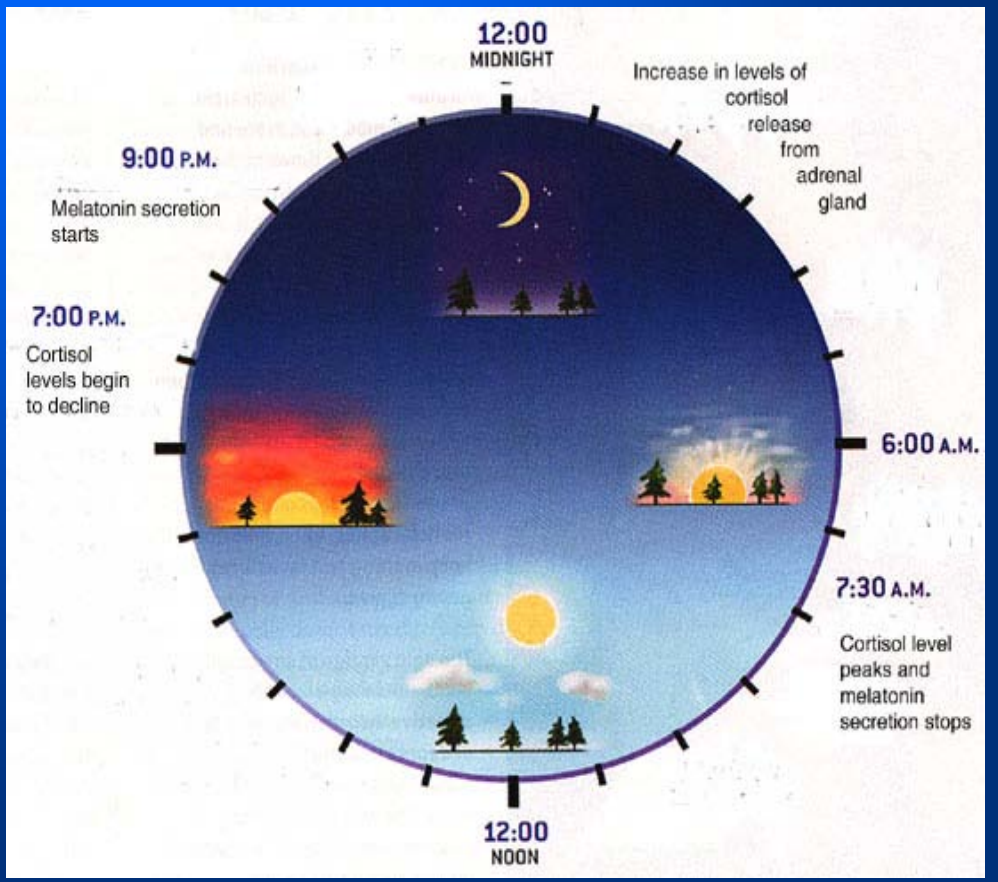
Suprachiasmatic nucleus: responds to cues, signals the VLPO to stop firing → arousal

The circadian “clock”

- Suprachiasmatic nucleus (hypothalamus)

Dysfunction

Shift work
Call responsibilities
Trans-time zone travel
Insomnia
Drugs & alcohol



Chemical modulators of wakefulness & sleep

- Acetylcholine
- Adenosine
- Dopamine
- Orexin A & B
- GABA
- Melatonin
- Norepinephrine
- Histamine
- Pituitary hormones
- Serotonin
- Glutamate
- Nitric oxide
- Cortisol

Many of us have abnormal expression of these modulators

National Sleep Foundation

Waking America to the Importance of Sleep®

March 3, 2009 National Sleep Survey Research Report

1/3 report falling asleep or severely sleepy at work

Average sleep / night = 6 hours, 40 minutes

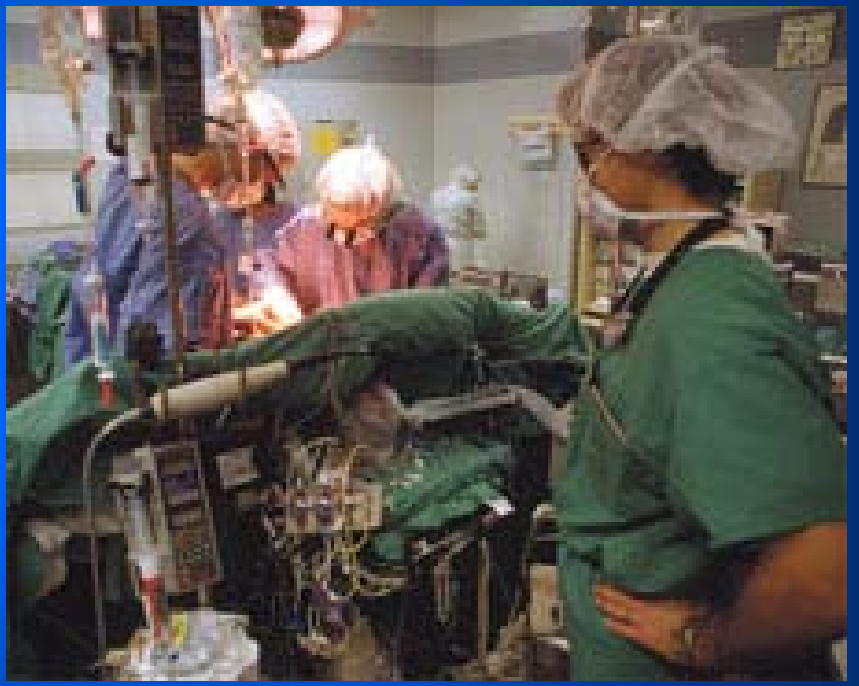
Average wake up time: 5:35 am
Average bedtime: 10:53 pm

At age 70 you have spent ~ 25 years sleeping!!

14 months old | 35 years old | 70 years old

Although many of us are shortchanging ourselves!

No epidemiological studies describe the sleep-related behaviors of anesthesia providers



Examples of formal work hour rules

Aviation

Long-haul trucking

Rail/road/ocean travel industries

Nuclear power

Healthcare education

Interstate Passenger Carrying Driver's Guide to Hours of Service

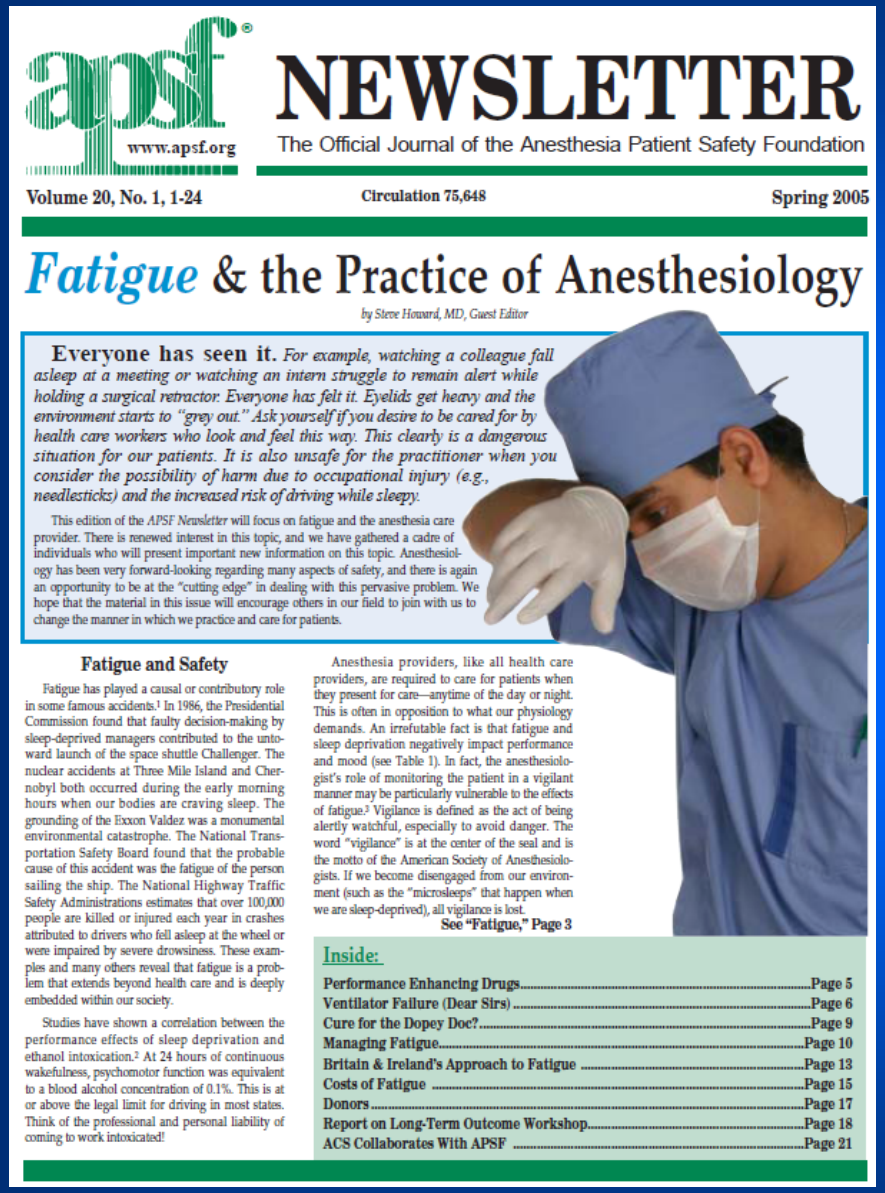
Table of Contents

Comparison of IOM Committee Adjustments with Current ACGME Duty-Hour Limits.

Variable	2003 ACGME Duty-Hour Limits	IOM Recommendation
Maximum hr of work per wk	80 hr, averaged over 4 wk	No change
Maximum shift length	30 hr (admitting patients up to 24 hr, then 6 additional hr for transitional and educational activities)	30 hr (admitting patients for up to 16 hr, plus 5-hr protected sleep period between 10 p.m. and 8 a.m., with the remaining hours for transitional and educational activities) 16 hr with no protected sleep period
Maximum in-hospital on-call frequency	Every third night, on average	Every third night, no averaging
Minimum time off between scheduled shifts	10 hr after shift	10 hr after day shift 12 hr after night shift 14 hr after any extended duty period of 30 hr, not returning until 6 a.m. of next day
Maximum frequency of in-hospital night shifts	Not addressed	48 hr off after 3 or 4 nights of consecutive duty
Mandatory time off	4 days per mo 1 day (24 hr) per wk, averaged over 4 wk	5 days per mo 1 day (24 hr) per wk, no averaging One 48-hr period per month
Moonlighting	Internal moonlighting counted against 80-hr weekly limit	Internal and external moonlighting counted against 80-hr weekly limit All other duty-hour limits apply to moonlighting in combination with scheduled work
Limit on hours for exceptions	88 hr for select programs with a sound educational rationale	No change
Emergency room limits	12-hr shift limit, at least an equivalent period of time off between shifts; 60-hr workweek with additional 12 hr for education	No change

NEJM. 12/18/08

The National Study of Sleep-related Behaviors of Nurse Anesthetists: Personal and Professional Implications



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NEWSLETTER

The Official Journal of the Anesthesia Patient Safety Foundation

Volume 20, No. 1, 1-24 Circulation 75,648 Spring 2005

Fatigue & the Practice of Anesthesiology

by Steve Howard, MD, Guest Editor

Everyone has seen it. *For example, watching a colleague fall asleep at a meeting or watching an intern struggle to remain alert while holding a surgical retractor. Everyone has felt it. Eyelids get heavy and the environment starts to "grey out." Ask yourself if you desire to be cared for by health care workers who look and feel this way. This clearly is a dangerous situation for our patients. It is also unsafe for the practitioner when you consider the possibility of harm due to occupational injury (e.g., needlesticks) and the increased risk of driving while sleepy.*

This edition of the *APSF Newsletter* will focus on fatigue and the anesthesia care provider. There is renewed interest in this topic, and we have gathered a cadre of individuals who will present important new information on this topic. Anesthesiology has been very forward-looking regarding many aspects of safety, and there is again an opportunity to be at the "cutting edge" in dealing with this pervasive problem. We hope that the material in this issue will encourage others in our field to join with us to change the manner in which we practice and care for patients.

Fatigue and Safety

Fatigue has played a causal or contributory role in some famous accidents.[1] In 1986, the Presidential Commission found that faulty decision-making by sleep-deprived managers contributed to the untoward launch of the space shuttle Challenger. The nuclear accidents at Three Mile Island and Chernobyl both occurred during the early morning hours when our bodies are craving sleep. The grounding of the Exxon Valdez was a monumental environmental catastrophe. The National Transportation Safety Board found that the probable cause of this accident was the fatigue of the person sailing the ship. The National Highway Traffic Safety Administrations estimates that over 100,000 people are killed or injured each year in crashes attributed to drivers who fell asleep at the wheel or were impaired by severe drowsiness. These examples and many others reveal that fatigue is a problem that extends beyond health care and is deeply embedded within our society.

Studies have shown a correlation between the performance effects of sleep deprivation and ethanol intoxication.[2] At 24 hours of continuous wakefulness, psychomotor function was equivalent to a blood alcohol concentration of 0.1%. This is at or above the legal limit for driving in most states. Think of the professional and personal liability of coming to work intoxicated!

Anesthesia providers, like all health care providers, are required to care for patients when they present for care—anytime of the day or night. This is often in opposition to what our physiology demands. An irrefutable fact is that fatigue and sleep deprivation negatively impact performance and mood (see Table 1). In fact, the anesthesiologist's role of monitoring the patient in a vigilant manner may be particularly vulnerable to the effects of fatigue.[3] Vigilance is defined as the act of being alertly watchful, especially to avoid danger. The word "vigilance" is at the center of the seal and is the motto of the American Society of Anesthesiologists. If we become disengaged from our environment (such as the "microsleeps" that happen when we are sleep-deprived), all vigilance is lost.

See "Fatigue," Page 3

Inside:

The study's origins

- Personal experiences
- Conversations with providers
- Reports from other domains
- Simulation studies
- Radio, TV, newspaper reports
- Sense of professional responsibility

Methodology

- IRB approved
- 10% of active AANA members surveyed– 7 regions
- Instrument reliability and validity established
- Random mailing Anonymous, postage paid return
- Closed & open ended questions
- Quantitative & qualitative analysis

Quantitative Findings

(42% return rate, 61% female)

- **80% go to bed after 10pm each night**
- **72% awake before 5:30am**
- **25% awaken ≥ 3x/night → fragmented sleep**
- **59% premature awakening → can't regain sleep**
- **56% daytime napping; 16% naps ≥ 60 minutes**
- **47% routinely have difficulty falling asleep at night**

Quantitative Findings

- 24% use of sleep medications to generate sleep
- 18.4% report restless legs syndrome
- 16.5% frequently have nightmares → arousal from sleep
- 56.2% have issues with snoring during sleep
- 68% report excessively tiredness during the work day

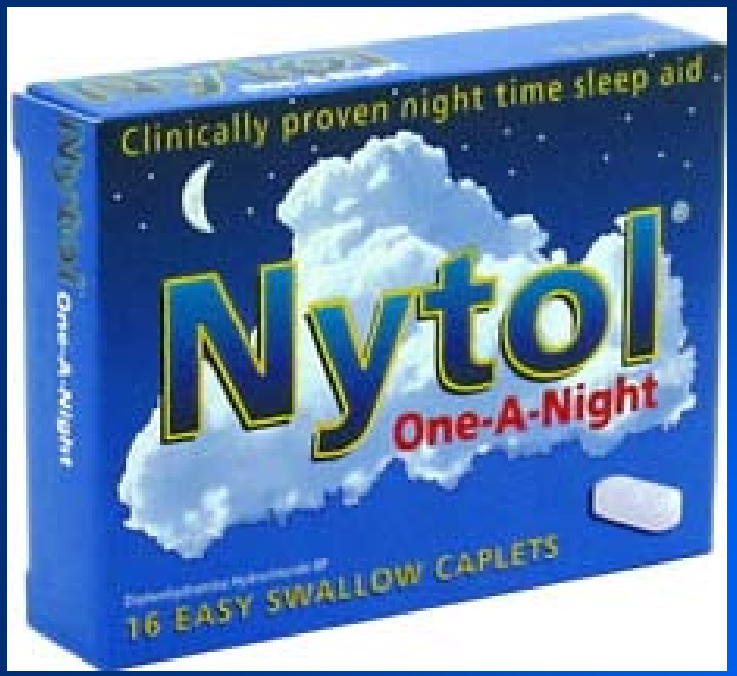
A – Alcohol
Advil PM
Aleve
Ambien & Ambien CR
Aspirin
Ativan
“Antihistamines”
B – Benadryl
BIPAP
C- CPAP
Calms Forte
Clonazepam
Cough syrup
D – Dramamine
E- Excedrin,
Excedrin pm
Ext Strength Tylenol
Extrovent pm
Ear plugs
Elavil
H – Halcion
Herbal OTC
I – Ibuprofen
K – Klonopin
L – Lunasom
Lunesta
Lyrica
M – Marijuana
Melatonin
Mirapex
Motrin
Morphine
N – Nyquil, Nytol
Nitetime cough syrup
R – Requip / Rozerem
Rapid sleep pm
Reading
Restoril
S- Sominex
Simple sleep
Seroquel
Sonata
St John’s Wart
Sominex
Sudafed
T-Tylenol pm
Trazadone
Tempzepam
Triazolam
Tryptophan
Tramadol
U - Unisom
V - Valarian
Vistaril
Valium
X - Xanax
Z – Zanaflex
Zaleplon
Zolpidem

Reported sleep aides used by respondents

NyQuil.

The nighttime sniffling, sneezing, coughing, aching, get-you-so-sloshed-you-think-your-cat-is-Elvis medicine.

Analgesic / antipyretic:	**Acetaminophen 500 mg / 15 mL**
Cough suppressant:	**Dextromethorphan 15 mg / 15 mL**
Antihistamine / hypnotic:	**Doxylamine 6.25 mg / 15 mL**

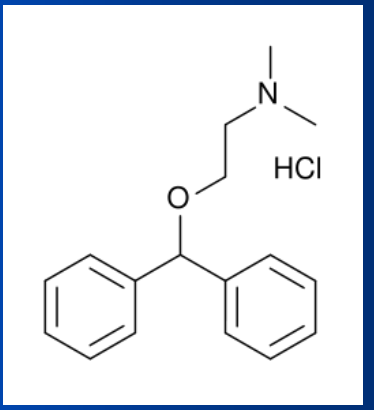


Contains diphenhydramine

+ Regular strength 25 mg / tablet

+ Extra strength 50 mg / tablet

Sominex, Sleepinal, Twilite, Unisom, etc.



- **Half-life 4-8 hours: hypnotic effect lasts ~ 6 hours**
- **Tolerance usually develops after a few days of use**
- **Significant and additive effects with alcohol, hypnotics, etc.**
- **Paradoxical effects in some, particularly the elderly**

Rebound insomnia

Psychological addiction

Low efficacy if abnormal neurotransmitters

2007 & 2008 & 2009: FDA orders stronger warnings for sleep aides

- **Ambien, Lunesta & 11 other common sleep aides**
- **Risk of bizarre and paradoxical behaviors**
  - ***Sleepwalking*** ***Hallucination*** ***Violent outbursts***
  - ***Nocturnal binge eating*** ***Abnormal sex drive*** ***Driving while asleep***

Sales for Ambien & Lunesta *alone* > $5 billion (2008)

Quantitative Findings

- 0.4% use stimulants (besides caffeine) to maintain wakefulness during workday
- 10.6% have sleep regularly disrupted due to child care issues
- 10.3% see or are considering seeing a sleep specialist
- 15.7% report having fallen asleep during an anesthetic
- 48.8% have witnessed a colleague asleep during a surgical case

Adderall

Caffeine (coffee, soft drinks)

Caffeinated drinks (Red Bull, NOS, Stacker, 5-Hour Energy) ™

Caffeine tablets (Nodoz™)

Herbal tea

Ephedra

Provigil (Cephalon, Equip)™

CX717 (investigational drug similar to Provigil)

Primatine mist nasal spray

Ritalin

Vivarin™

Vyvanse™

Wakefulness promoters reportedly used by respondents

What's in that stuff?

Hershey's Chocolate Kiss	1mg
12 oz. Snapple Tea	32mg
12 oz. Coca-Cola Classic	34mg
12 oz. Dr. Pepper	41mg
12 oz. Mountain Dew	55mg
8.5 oz. Red Bull	80mg
8 oz. coffee	135mg (variable)
1 Vivarin™ caffeine pill	200mg
16 oz. Starbucks Coffee Grande	259mg
24 oz. BooKoo Energy drink	360mg

Issues provoking or exacerbating loss of sleep

- **Menopause, frequent need to urinate, aging worsens the problem**
- **Shift work, swing shifts, call back from home**
- **Anxiety over caseload, challenging cases, cases that went poorly**
- **Snoring bed partner**
- **Obstructive sleep apnea syndrome, restless leg syndrome**
- **Nightmares**
- **Domestic issues: child care, care of ill spouse/parent, lacks partner help**
- **Medical-legal, financial, relationship, workplace problems**
- **A vicious cycle of poor sleep, stress, worsening sleep**

Issues indicating concern for patient and personal safety

- **Personally falling asleep during anesthetic care**
- **Feeling “at risk” of falling asleep during anesthetic care**
- **Aware of colleagues engaging in sleep behaviors during anesthetic care**
- **Making errors of omission; making errors of commission**
- **Falling asleep while driving after a long shift**
- **Generalized cognitive impairment from sleep-fatigue**
- **Chronic sleep loss is deleterious to my health**
- **In denial about nature and extent of problem**

Suggestions for dealing with the problem of sleep-related fatigue

- **Regulation needed — work hour restrictions like airline pilots**
- **Improved, scheduled breaks during work hours**
- **Sleep aides education needed: medications are a two-edged sword**
- **Start cases later in the day**
- **Provide nap-rooms at work**
- **Feel safe in admitting problem. Seek professional help if problem persists**

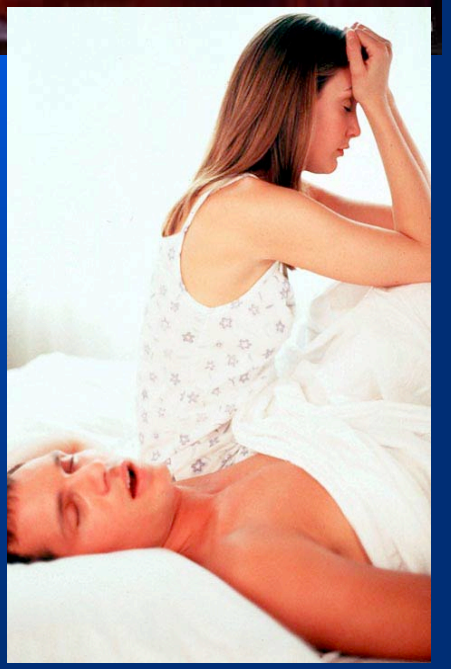
Miscellaneous criticisms/questions of the study's intent and design

- **Worthless study---sleep-related issues not a problem in clinical practice**
- **Timely study, provokes needed discussion about workplace safety**
- **Use Ipod ear buds to listen to music to keep me alert. Is this bad?**
- **Does reading or listening to books on tape help or hurt?**
- **Does using the Internet during cases help or hurt?**
- **Thank you! Have seen patients &colleagues hurt by sleep issues**
- **Waste of time, we knew all this already**
- **You bring negative publicity to us! This will hurt us with physicians!**
- **Likely underestimating problem---people reluctant to admit problems**

Sleep disturbances are common

- ~ 40% adults→ acute/chronic issues each year
- *Under-reporting is very likely*
- Links to health, social and job dysfunction

- Metric of its pervasiveness
  - OTC & prescription advertising (TV, radio, magazine)
  - Widespread & growing use of sleep aides
  - Financial success of distributors
  - Surveys of worker fatigue



Anesthesiology 2006; 104:1081–93

Practice Guidelines for the Perioperative Management of Patients with Obstructive Sleep Apnea

A Report by the American Society of Anesthesiologists Task Force on Perioperative Management of Patients with Obstructive Sleep Apnea

CME This article has been selected for the *Anesthesiology* CME Program. After reading the article, go to http://www.asahq.org/journal-cme to take the test and apply for Category 1 credit. Complete instructions may be found in the CME section at the back of this issue.

PRACTICE guidelines are systematically developed recommendations that assist the practitioner and patient in making decisions about health care. These recommendations may be adopted, modified, or rejected according to clinical needs and constraints. Practice guidelines are not intended as standards or absolute requirements. The use of practice guidelines cannot guarantee any specific outcome. Practice guidelines are subject to revision as warranted by the evolution of medical knowledge, technology, and practice. They provide basic recommendations that are supported by analysis of the current literature and by a synthesis of expert opinion, open forum commentary, and clinical feasibility data.

This article is featured in "This Month in Anesthesiology." Please see this issue of ANESTHESIOLOGY, page 5A.

Additional material related to this article can be found on the ANESTHESIOLOGY Web site. Go to http://www.anesthesiology.org, click on Enhancements Index, and then scroll down to find the appropriate article and link. Supplementary material can also be accessed on the Web by clicking on the "ArticlePlus" link either in the Table of Contents or in the HTML version of the article.

Developed by the American Society of Anesthesiologists Task Force on Perioperative Management of Obstructive Sleep Apnea: Jeffrey B. Gross, M.D. (Chair), Farmington, Connecticut; Kenneth L. Bachenberg, M.D., Bellingham, Washington; Jonathan L. Benumof, M.D., San Diego, California; Robert A. Caplan, M.D., Seattle, Washington; Richard T. Connis, Ph.D., Woodinville, Washington; Charles J. Coté, M.D., Boston, Massachusetts; David G. Nickinovich, Ph.D., Bellevue, Washington; Vivek Prachand, M.D., Chicago, Illinois; Denham S. Ward, M.D., Rochester, New York; Edward M. Weaver, M.D., M.P.H., Seattle, Washington; Lawrence Ydero, M.D., Santa Fe, New Mexico; Song Yu, M.D., Farmington, Connecticut.

Submitted for publication November 1, 2005. Accepted for publication November 1, 2005. Supported by the American Society of Anesthesiologists under the direction of Jamie F. Arens, M.D., Chair, Committee on Practice Parameters. Approved by the House of Delegates on October 25, 2005. A complete list of references used to develop these Guidelines is available by writing the American Society of Anesthesiologists. These Guidelines have been endorsed by the American Academy of Sleep Medicine and the American Academy of Otolaryngology–Head and Neck Surgery. They have received an "Affirmation of Value" from the American Academy of Pediatrics.

Address reprint requests to the American Society of Anesthesiologists: 520 North Northwest Highway, Park Ridge, Illinois 60068-2573. This Practice Guidelines article, as well as all published ASA Practice Parameters, may be accessed at no charge through the Journal Web site, www.anesthesiology.org.

Methodology

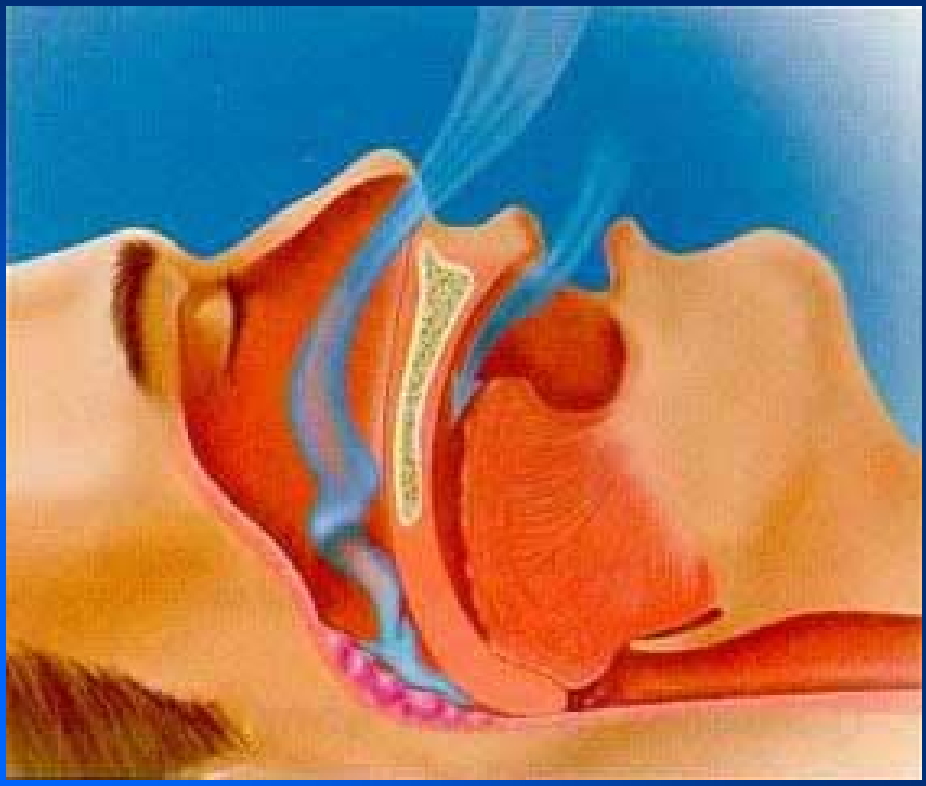
A. Definition of Obstructive Sleep Apnea

Obstructive sleep apnea (OSA) is a syndrome characterized by periodic, partial, or complete obstruction of the upper airway during sleep. This, in turn, causes repetitive arousal from sleep to restore airway patency, which may result in daytime hypersomnolence or other daytime manifestations of disrupted sleep such as aggressive or distractible behavior in children. The airway obstruction may also cause episodic sleep-associated oxygen desaturation, episodic hypercarbia, and cardiovascular dysfunction. It is estimated that the adult prevalence of sleep disordered breathing, as measured in a sleep laboratory, is 9% in women and 24% in men, whereas the prevalence of overt OSA has been estimated to be 2% in women and 4% in men.[1] These figures are likely to increase as the population becomes older and more obese. In the perioperative period, both pediatric and adult patients with OSA, even if asymptomatic, present special challenges that must be systematically addressed to minimize the risk of perioperative morbidity or mortality. It is the opinion of the Task Force that the perioperative risk to patients increases in proportion to the severity of sleep apnea.

Because procedures differ among laboratories, it is not possible to use specific values of indices (such as the apnea-hypopnea index [AHI]) to define the severity of sleep apnea. Therefore, for the purposes of these Guidelines, patients will be stratified using the terms *mild*, *moderate*, and *severe* as defined by the laboratory where the sleep study was performed.

B. Purpose of the Guidelines

The purpose of these Guidelines is to improve the perioperative care and reduce the risk of adverse outcomes in patients with OSA who receive sedation, analgesia, or anesthesia for diagnostic or therapeutic procedures under the care of an anesthesiologist. The Task Force recognizes that it is not possible to determine with 100% accuracy whether a given patient will develop perioperative complications related to OSA. Therefore, these Guidelines should be implemented with the goal of reducing the likelihood of adverse outcomes in patients who are judged to be at the

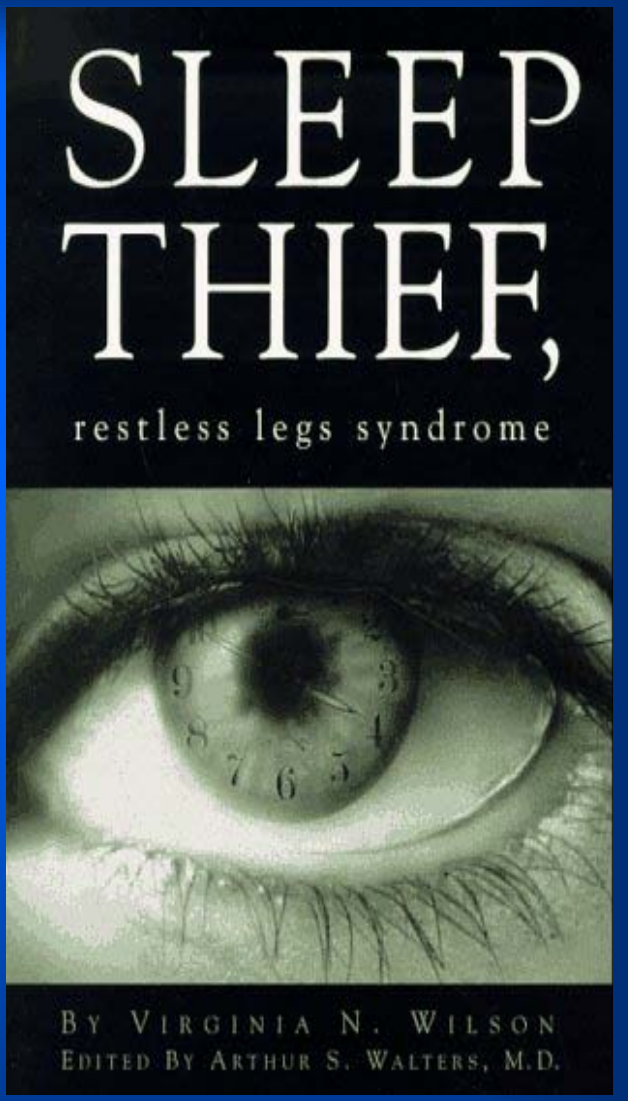


Anesthesiology
May 2006 1081-1093

Restless legs syndrome

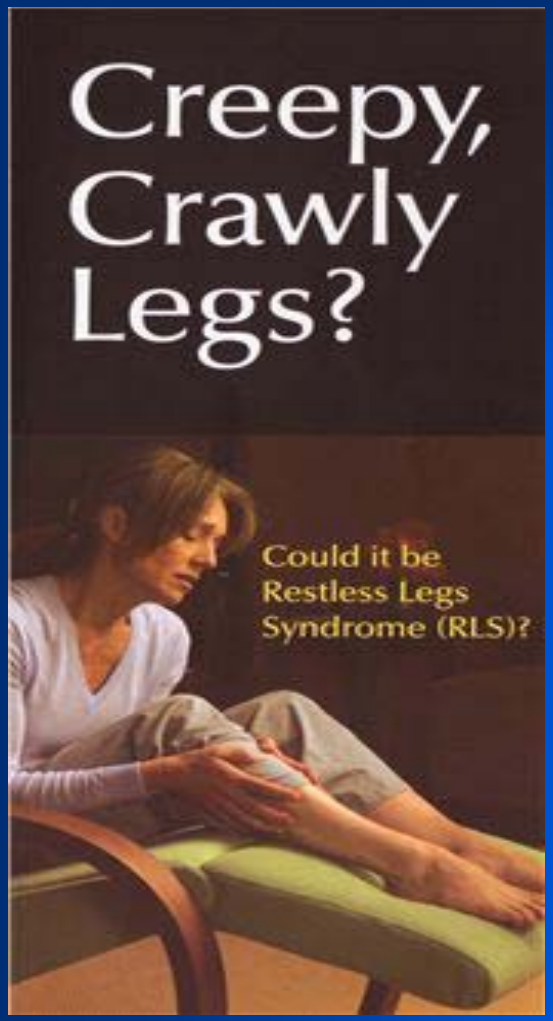
Periodic limb movement disorder

- 41 yo with nightly insomnia for 10 yrs
- “Uncomfortable sensations in my legs”
- “Uncontrollable urge to move my legs”
- Sensation only relieved by walking
- Maddening to bed partner
- Daytime life is distressing – exhaustion



- 5 - 20% of Americans
- Under-reporting is highly likely

JAMA 2007;297:1865-6
J Int Med 2009;266:419-431



- **FDA approved drug for RLS**
- **Anti-parkinsonian agent**
- **Activates postsynaptic dopamine receptors**

Narcolepsy

1:2,000 Americans suffer

Inappropriate, sudden hypersomnia
Low levels hypothalamic neuropeptides
Autoimmune injury to secreting cells?

Rx: **Behavior modification to Px injury**
Family & coworkers involved
Ritalin
Selective serotonin reuptake inhibitors
Provigil

Treatment of Narcolepsy and other Hypersomnias of Central Origin

An American Academy of Sleep Medicine Review

Merrill S. Wise, MD[1]; Donna L. Arand, PhD[2]; R. Robert Auger, MD[3]; Stephen N. Brooks, MD[4]; Nathaniel F. Watson, MD[5]

[1]Methodist Healthcare Sleep Disorders Center, Memphis, Tennessee; [2]Wright State University, Dayton, OH; [3]Mayo Clinic College of Medicine, Rochester, MN; [4]Stanford Sleep Disorders Clinic, Stanford, CA; [5]University of Washington, Seattle, WA

Objective: The purpose of this paper is to summarize current knowledge about treatment of narcolepsy and other hypersomnias of central origin.

Methods: The task force performed a systematic and comprehensive review of the relevant literature and graded the evidence using the Oxford grading system. This paper discusses the strengths and limitations of the available evidence regarding treatment of these conditions, and summarizes key information about safety of these medications. Our findings provide the foundation for development of evidence-based practice parameters on this topic by the Standards of Practice Committee of the American Academy of Sleep Medicine.

Results: The majority of recent papers in this field provide information about use of modafinil or sodium oxybate for treatment of sleepiness associated with narcolepsy. Several large randomized, placebo-controlled studies indicate that modafinil and sodium oxybate are effective for treatment of hypersomnia due to narcolepsy. We identified no studies that report direct comparison of these newer medications versus traditional stimulants, or that indicate what proportion of patients treated initially with these medications require transition to traditional stimulants or to combination therapy to achieve adequate alertness. As with the traditional stimulants, modafinil and sodium oxybate provide, at best, only moderate improvement in alertness rather than full restoration of alertness in patients with narcolepsy. Several large randomized placebo-controlled studies demonstrate that sodium oxybate is effective for treatment of cataplexy associated with narcolepsy, and earlier studies provide limited data to support the effectiveness of fluoxetine and tricyclic antidepressants for treatment of cataplexy. Our findings indicate that very few reports provide information regarding treatment of special populations such as children, older adults, and pregnant or breastfeeding women. The available literature provides a modest amount of information about improvement in quality of life in association with treatment, patient preferences among the different medications, or patient compliance.

Conclusion: Several recent studies provide evidence that modafinil and sodium oxybate are effective for treatment of hypersomnia due to narcolepsy. No studies were identified that report direct comparison of these newer medications with traditional stimulants. Despite significant advances in understanding the pathophysiology of narcolepsy, we do not have an ideal treatment to restore full and sustained alertness. Future investigations should be directed toward development of more effective and better tolerated therapies, and primary prevention.

Keywords: Hypersomnia, narcolepsy, cataplexy, modafinil, sodium oxybate, stimulants

Citation: Wise MS; Arand DL; Auger RR; Brooks SN; Watson NF. Treatment of Narcolepsy and other Hypersomnias of Central Origin. *SLEEP* 2007;30(12):1712-1727.

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Disclosure Statement

This is not an industry supported study. Dr. Brooks has worked for Pacific Sleep Medicine a company that contracts to participate in industry sponsored clinical trials. The other authors have indicated no financial conflicts of interest.

Submitted for publication September, 2007
Accepted for publication September, 2007

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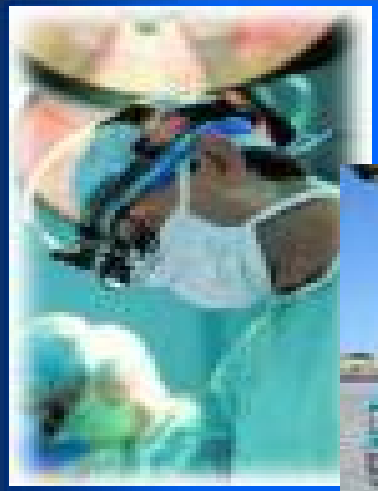
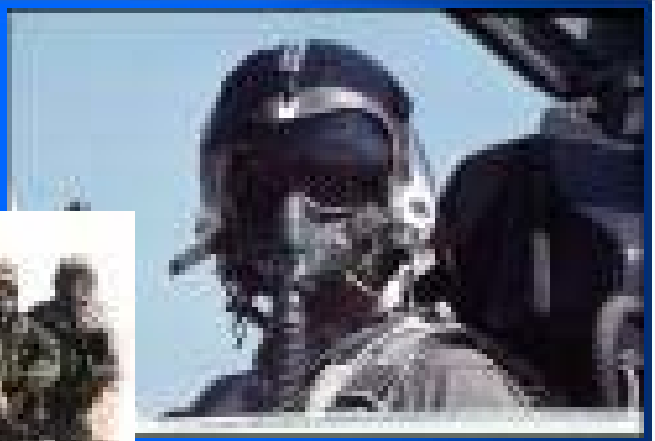
***Sleep* 2007**

Modafinil (Provigil)





- Wakefulness-promoting drug
- FDA approved: narcolepsy, OSAS, ‘shift work syndrome’
- Inhibits dopamine and norepinephrine reuptake
- Activity at hypothalamus (orexin neurons)

2004 Gold Medal Revoked
1600 M Relay
Calvin Harrison

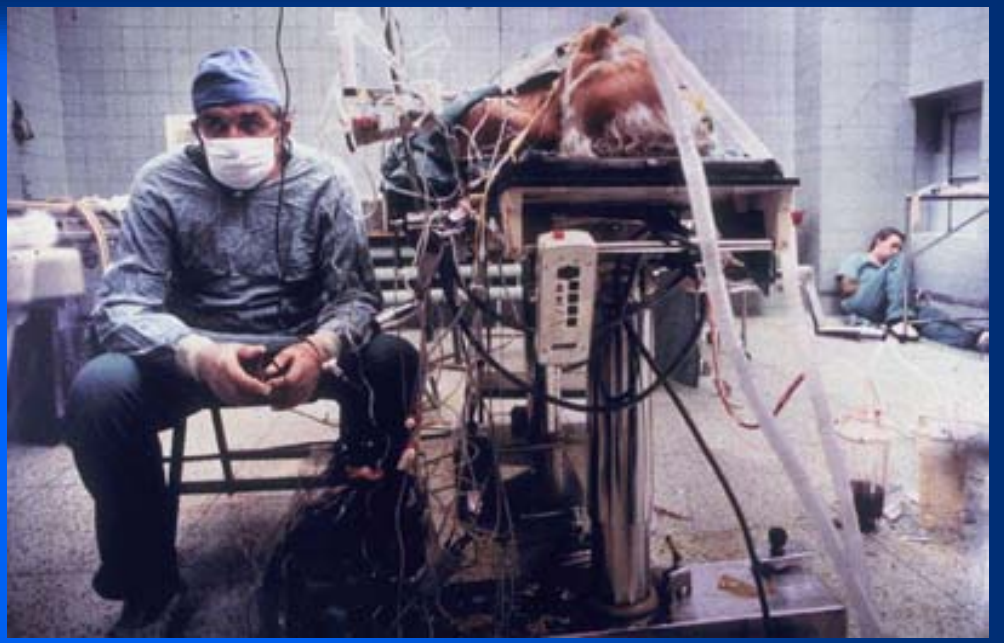
Modafinil
Armodafinil
CEP-1675
CX-717

Arlington, Virginia

We all have a major stake in understanding the impact of sleep on clinical performance and career sustainability

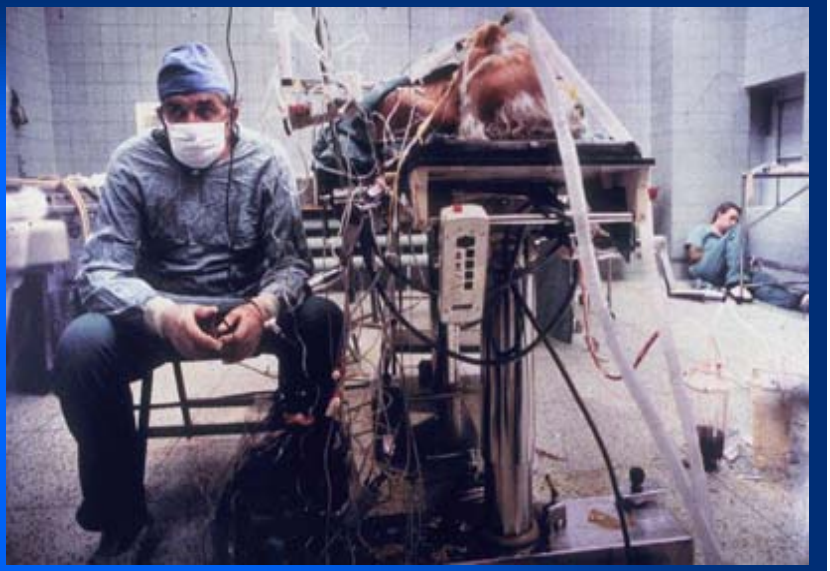
Sleep deprivation impairs vigilance and neuro-cognitive function

The anesthesia provider……



- Renders care when the patient presents (day or night)
- Timing of task readiness & rest --- often asynchronous
- Fatigue & sleep deprivation negatively impact performance
- Each of us is genetically “hard wired” for sleep requirement

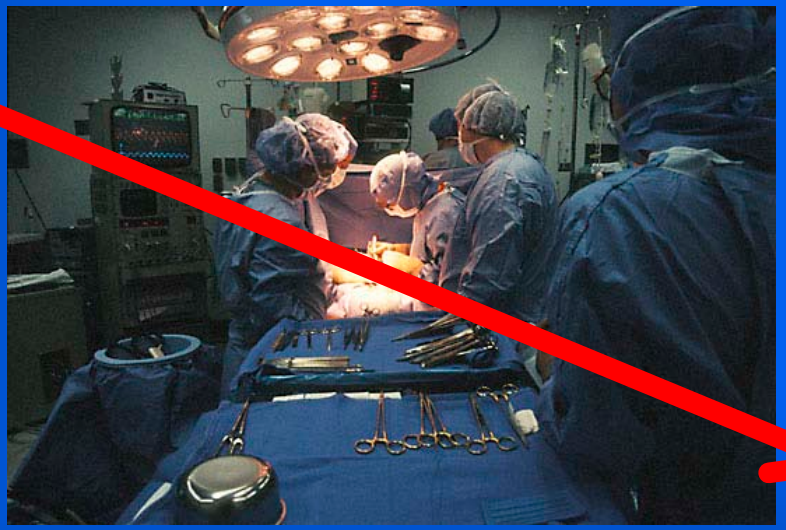
Many anesthesia providers…..



- **Are chronically sleep deprived**
- **Commonly push the envelope further & further**
- **Are often unaware (*or in denial*) of degree of impairment**

Layering acute sleep deprivation on top of an existing sleep debt is a recipe for catastrophe* ^

***Van Dongen. *Sleep* 2003:26:117**
^Dement. Personal communication. 4/10



How often have you been here???

Sleep debt, sitting still, repetitive task performance
-- seriously degrade coping defenses --

The combination of :

- Sleep deprivation
- Life stressors
- Prescription drugs / OCT drugs
- Overall physical health
- Overall mental health
- Alcohol use / ‘recreational’ drugs

The Human Condition

Have profound and variable effects upon each of us

24 hours of continuous wakefulness = BA 0.1%*^

*Dawson. *Nature*. 1997;388:235

^Dement. Personal communication. 4/10

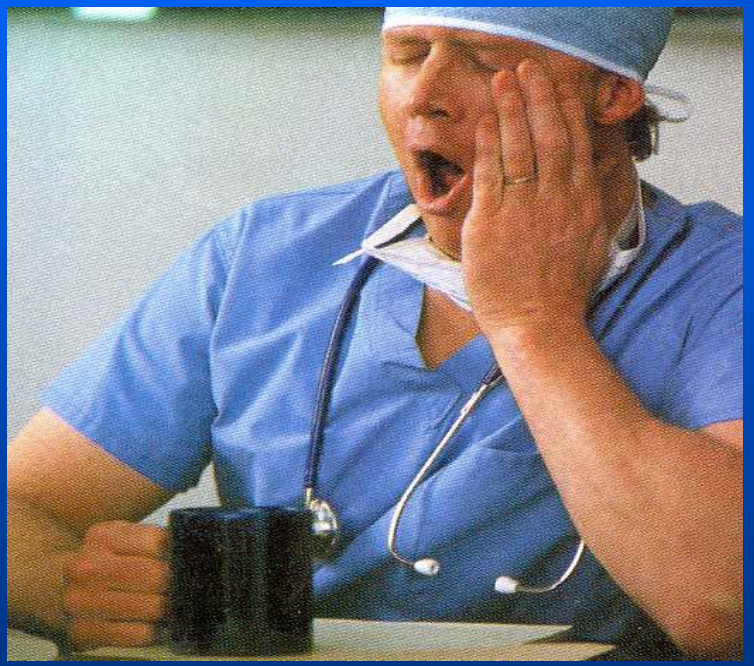
Caveats

- Fatigue / sleepiness = major provider concerns
- Greater detrimental effects with age*
- **Sleepiness during patient care removes an essential layer of protection in a very dangerous environment**
- Many providers fall asleep during care yet deny doing so*^

*Reilly. Age, rhythms of physical performance. Occup Environ Med. 1997; 54:812.
^Howard. Risks of excessive sleepiness in residents. Acad Med. 2002; 77: 1019.

Should there be regulation?

- Bus drivers
- Airline pilots
- Truck drivers
- Cruise ship captains
- Train / subway operators



- **What about us?**

- Too often ***The Sleepy are Keeping People Asleep***

Sleep-related fatigue

Major concern in any domain where workforce behavior has immediate or potential negative consequences for others

Often the danger is self-evident. What we do with it is up to us.

?s

- You witness a provider who falls asleep while engaging in patient care....
- A surgeon or circulator tells you that a departmental member was sleeping during patient care....
- You are aware of a colleague who frequently self-medicates to remain alert at work….
- You are falling asleep during patient care and you have recently experienced ‘near misses’….

…..what would you do?