

Virtual Mentor
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Virtual Mentor

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FROM THE EDITOR

The Importance of Paying Attention to Sleep

Many physicians consider sleep medicine a fascinating field because of the tremendous advances in research made in the past decades. These discoveries have been significant not only for their basic scientific value and clinical applications but also for the light they shed on profound philosophical questions such as the definition and meaning of consciousness. As true as these statements are, it could just as truthfully be said that sleep medicine is fascinating because of what is yet to be learned and the scientific studies yet to be undertaken. The current nosology of sleep disorders, for example, is symptom driven, meaning that dysfunctions are classified by patients' subjectively reported symptoms rather than by anatomical reference or pathophysiology. Because of this subjective component, perceptions of sleep disorders can vary greatly by geographical area, religious and cultural background, and age. Hence, setting guidelines for ethical standards of care in sleep medicine is a complex task.

Three subcategories of ethics are often distinguished: (1) normative ethics—how should we behave? (2) metaethics—when ethical principles conflict, how do we decide which takes precedence? (3) applied ethics—what conduct is proper for certain groups of people or under certain circumstances? Sleep medicine raises questions in all three areas. Beyond the normative ethics of everyday clinical decision making, physicians also confront conflicting ethical standards for practicing evidence-based sleep medicine, and they ponder how to apply clinical ethics to the new discoveries in neuroscience that affect how we think about consciousness and how sleep medicine is practiced.

This issue of *Virtual Mentor* opens with four case studies analyzed by veteran clinicians who specialize in sleep medicine. Eric Frenette explores the tension between paternalism and respect for patient autonomy in a physician's response to a patient who wants to use a sleep disorder treatment drug for cognitive enhancement. Clete Kushida discusses a physician's professional obligation to provide testimony in court for a patient who committed a crime while sleepwalking. In a third case, Dennis Auckley examines a difficult patient-physician relationship—something many of us encounter in our daily practice. The difficulty is further complicated when the patient's report of insomnia symptoms cannot be objectively measured, and clinical progress is not easy to assess. Finally, Shannon Sullivan weighs the ethical principles of beneficence, nonmaleficence, and respect for autonomy in the case of a patient with REM behavior disorder that might be a precursor to a neurodegenerative disease. Should the physician inform the patient of the possible future illness?

Delays between scientific advances in sleep medicine and their acceptance by the general medical community and the public and influence on policy occasionally manifest as culture clashes and ethical dilemmas in the clinic and beyond—situations we examine in the remainder of the issue.

A problem that underlies many others is the disparity between what is currently known about sleep disorders and what is taught in medical schools. Although many physicians are interested in sleep disorders, they are not trained in methods of detection and treatment and are unable to integrate sleep medicine into their practices. Christopher Miller suggests how this gap might be closed in his medical education article. The policy forum by Kingman Strohl asserts that society has a duty to protect would-be victims of sleepy drivers. He outlines the responsibilities of the driver, physician, and licensing agencies in recognizing and managing disorders and medications that impair driving. One of the most common of those disorders is obstructive sleep apnea, the cause and diagnosis of which Nitun Verma describes in the clinical pearl.

Rob Meadows sheds light on the “rights and duties” of the sleeper in his medicine-and-society essay and introduces the idea of the medicalization of sleep disorders. In the journal discussion, Christian Krautkramer traces the first expression of that trend—looking at how the media have contributed to establishing lack of sleep as a medical disorder. The medicalization of sleep disorders has two distinct forms—labeling deviation from normal sleep as a disease and enhancing what is considered “normal” wakefulness through medical interventions. William Cheshire Jr.’s op-ed piece—“The Pharmacologically Enhanced Physician”—takes the second expression of medicalization to one of its obvious conclusions.

In another perspective on how society views sleep, Steven Kroll-Smith reminds us that, while napping is becoming an acceptable workplace activity, there was a time when sleep was regarded as a necessary evil, and those who needed less of it were more highly valued as employees. Michael Bornemann, the world’s first sleep forensics expert, explains the proper role of ethical directives in guiding criminal case expert medical testimony, which he views primarily as an educational—not an adversarial—role.

Our cultural ideas about sleep and its relationship to our physiological needs, health, and safety are changing rapidly. Those who practice in the field of sleep medicine must establish standards of patient care on the basis of sparse evidence and determine how best to address sleep disorders at the public health and policy levels. I hope this issue of *Virtual Mentor* awakens some of you to the new and exciting field of sleep medicine, a field that is more than just “interesting,” and an important aspect of our overall health that is often overlooked.

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CLINICAL CASE

Prescribing in the Absence of Medical Need

Commentary by Eric Frenette, MD

Jocelyn was a type A personality and an overachiever. For 4 years she had been working 90 hours a week for a high-powered investment banking company. She had finished at the top her class at one of the best MBA programs in the country and was always trying to find a way to do more, be more, accomplish more. She had recently learned that a friend was taking a medication called modafinil (used in the treatment of conditions such as narcolepsy and attention-deficit disorder). Even though Jocelyn had never experienced excessive daytime sleepiness or symptoms of attention deficit disorder, she wondered if, given her demanding job, the drug could give her an “edge.” She asked her friend for a few pills and noticed a significant improvement in her ability to concentrate. Encouraged by the results, Jocelyn made an appointment to see her primary care physician, Dr. Davis, to obtain a prescription for herself.

“You wouldn’t believe how well I can concentrate when I take modafinil. My memory is better than it’s ever been. I have gotten more work done, and now I actually have the energy to exercise after work,” Jocelyn told Dr. Davis.

“Even though you are experiencing benefits from the medication, you don’t have symptoms of daytime sleepiness indicating an underlying condition that would make it appropriate to prescribe,” replied the doctor.

Jocelyn questioned Dr. Davis, “But I’m not having any side effects, and I’ve read it isn’t addictive. I mean, it is doing me a lot of good, and isn’t it your job to do what’s in my best interest?”

Dr. Davis thought that Jocelyn had a point—modafinil does produce, for many people, the results she had described—and he could tell that her perceived quality of life was enhanced by taking this medication.

Commentary

We face these types of demands in our clinical practice regularly: “normal” patients asking for ways to cope with their environment, either through medication or other means. State laws on prescribing practices vary, but, if we take California’s Business and Profession Code as an example, we see that section 725 (a)(3) states that: “Repeated acts of clearly excessive prescribing, or administering of drugs or treatment...is unprofessional conduct for a physician and surgeon... Any person who engages in clearly excessive prescribing or administering or drugs or treatment is guilty of a misdemeanor” [1]. In our case Jocelyn has no diagnosed pathology,

thus no clear *medical* reason for taking this medication. Prescribing modafinil under these circumstances would put Dr. Davis on very shaky legal ground.

Since our case looks mainly at performance enhancement, we may want to see how other professional organizations, such as amateur sports, have handled nonmedically necessary pharmacological agents. Modafinil is considered a stimulant and is banned by World Anti-Doping Agency (WADA) [2]. Recently, several U.S. track and field athletes who tested positive for this substance were either stripped of medals or temporarily banned from competition [3].

For medical purposes, modafinil is a schedule 4 drug, thus differing from the classic stimulants like amphetamines, which are listed under schedule 2 [4]. Although the modafinil monography lists the drug as having a low potential for abuse [5], there is disagreement within the profession concerning its euphoric effects and real abuse potential [6].

We often prescribe drugs for conditions for which their use was not approved by the FDA—a practice known as off-label prescribing. Modafinil is no exception; it has been used for attention-deficit disorder and other conditions. It is important to understand that off-label use follows trials in which pathological disorders have been investigated and treated effectively with the drug in question. Results of these studies are published in peer-reviewed journals or presented at scientific meetings, thus stimulating interest in the new usage. To date there is no scientific data supporting use of modafinil for Jocelyn's condition. Sheer exhaustion from an impossible schedule is not a medical disease. To our patient, life is a competition and she is willing to try anything to gain or maintain an edge.

That Jocelyn took the drug for a few days and felt better raises many questions. Will the dosage remain effective, or will she want higher doses as her work and stress levels increase? If ever-higher doses are needed, is she likely to try to obtain modafinil through the Internet or even “graduate” to other psychostimulants? Would she be tempted to try illegal drugs that enhance alertness?

I believe that prescribing this drug for a nonmedical reason will lead Dr. Davis and Jocelyn down the slippery slope of expectative efficacy. Opinion 8.06 of the American Medical Association's *Code of Medical Ethics* reads: “Physicians should prescribe drugs, devices, and other treatments based solely upon medical considerations and patient need and reasonable expectations of the effectiveness of the drug, device or other treatment for the particular patient” [7]. Jocelyn's reasons for wanting the drug are not medical, therefore drug prescription for the purpose stated in our story would probably be considered unethical. Should we “drug” our patients in order to help them cope with their everyday life? Is modafinil, in this case, more of a lifestyle drug than a medical drug?

Denying Jocelyn a prescription for modafinil does not fulfill Dr. Davis's professional duty to his patient. Instead of supplying her with a “miracle drug,” Dr. Davis should

reflect on Jocelyn's work schedule and either advise her to modify her habits before the routine gets the better of her, or, after listening to her, refer her to a therapist for a professional opinion. I doubt that Dr. Davis would have brought up the use of modafinil in the first place if Jocelyn hadn't mentioned that she had already tried it. Reviewing the reasons *why* Jocelyn wants the drugs—beyond just the alertness—may go a long way in treating what is really bothering Dr. Davis's patient.

So, Dr. Davis would be wise to refrain from prescribing modafinil to Jocelyn and should either take charge of the situation, which is a lifestyle problem rather than a physiologic one, or encourage her to search for a medical diagnosis by referring her to appropriate specialists.

References

1. California Business and Professions Code Section 725-733. Unprofessional conduct. <http://law.justia.com/california/codes/bpc/725-733.html>.
2. World Anti-Doping Agency. World anti-doping code. The 2008 prohibited list. International standard. http://www.wada-ama.org/rtecontent/document/2008_List_En.pdf. Accessed July 15, 2008.
3. Associated Press. USOC IDs failed drug test athletes. <http://www.cbsnews.com/stories/2003/12/30/national/main590778.shtml>. Accessed July 15, 2008.
4. US Department of Justice. *Lists of: Scheduling Actions, Controlled Substances, Regulated Chemicals*. Washington, DC: Drug Enforcement Agency; 2008. <http://www.deadiversion.usdoj.gov/schedules/orangebook2008.pdf>. Accessed July 15, 2008.
5. Provigil [package insert]. Frazer, PA: Cephalon, Inc.; 2008. http://www.provigil.com/Media/PDFs/prescribing_info.pdf. Accessed July 15, 2008.
6. Kruszewski SP. Euphorigenic and abusive properties of modafinil. *Am J Psychiatry*. 2006;163(3):549.
7. American Medical Association. Opinion 8.06 Prescribing and dispensing drugs and devices. *Code of Medical Ethics*. Chicago, IL: American Medical Association; 2008. http://www.ama-assn.org/apps/pf_new/pf_online?f_n=browse&doc=policyfiles/HnE/E-8.06.HTM&&s_t=&st_p=&nth=1&prev_pol=policyfiles/HnE/E-7.05.HTM&nxt_pol=policyfiles/HnE/E-8.01.HTM&. Accessed July 15, 2008.

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CLINICAL CASE

When the Patient-Physician Relationship Is Broken

Commentary by Dennis Auckley, MD

Dr. Key, a recognized leader in the treatment of patients with insomnia, particularly enjoyed the challenge of helping people with longstanding and difficult insomnia, whom he was often able to treat effectively. After almost a year of treatment Ms. Miller was proving to be an exception, and Dr. Key was beginning to think he could not help her. She was demanding, often calling his office several times a week, leaving voicemail messages longer than the time allotted. Ms. Miller would refuse Dr. Key's recommendations, making excuse after excuse about why each wouldn't work for her. When Dr. Key saw Ms. Miller's name on the schedule, he knew the appointment would take at least 45 minutes longer than was scheduled because she would break down crying at the end of the visit, bringing up new psychosomatic symptoms, or threatening to sue Dr. Key when he attempted to conclude the visit. Since her appointment time would run late, the remainder of the patient schedule would become delayed, which would frustrate the other patients who would take it out on the office staff. Dr. Key couldn't understand why Ms. Miller would continue to schedule visits to see him even though she frequently told him their visits weren't helping. He was aware that something about Ms. Miller reminded him of his ex-wife and he couldn't help but feel resentful of the time spent with her. He wondered whether it was ethical to bill for visits which were not productive but he feared asking her not to come back because he knew she would perceive it as abandonment, and he was afraid of being sued.

Commentary

Dr. Key, a prominent specialist in the management of insomnia patients, is faced with a patient he is unable to treat successfully. Ms. Miller refuses to follow Dr. Key's treatment recommendations, while continuing to show up at the clinic, where she often becomes emotional and dramatic, and threatens to sue Dr. Key when he attempts to conclude the visit in a timely manner. Dr. Key develops resentment toward Ms. Miller, in part because she reminds him of his ex-wife. This case raises questions about countertransference, futility of care, and whether and how it is appropriate to sever the patient-physician relationship.

Countertransference

It is normal for an individual's current relationships (Dr. Key's, in our case) to be influenced by those of the past. Transferring feelings one had for someone in the past onto another individual in the present is called transference [1]. The patient-physician relationship is subject to transference because the patient's perception of the physician is influenced by prior experiences. These influences can be both positive

and negative and can enhance or detract from the present relationship. Likewise, a physician may have an emotional response to the patient based on his or her own past relationships, a response known as countertransference [1].

Countertransference can be considered in both a personal and a more general context. On the personal level, the physician “brings [his or her own] biases and emotional needs to the encounter, resulting in a dynamic interaction that ultimately shapes the outcome of the relationship” [2]. In its more general context, countertransference is an expected response of a physician to a difficult patient; that is, most physicians would be expected to respond to a difficult patient the way Dr. Key does, regardless of past personal experiences.

Dr. Key is clearly experiencing countertransference with his patient, Ms. Miller, as a result of his *personal* past experiences—although his emotional reaction would probably be shared to some extent by many others for whom the personal connection was absent. The first step in dealing with countertransference is to recognize that it is present. Once the physician recognizes the behavior, he or she can step back and assess the situation more objectively. If the countertransference is resulting from past personal experiences and can be controlled or minimized, then the relationship should continue. If Dr. Key feels that his past is strongly affecting the patient-physician relationship and he cannot alter his feelings and behavior, he should consider removing himself from the case.

Futility of Care

The principle of futility in medical care has been debated and discussed extensively in the literature, particularly in the context of the critically and terminally ill [3]. In this setting, unproven and potentially harmful therapies and standard therapies that will not alter outcomes could all come under the heading of futile. One example of futile treatment is an operation requested by a terminally ill patient that will not affect his or her condition in any beneficial way. In most contexts, physicians are at liberty to refuse patient requests for treatments that, in their clinical judgment, will produce no benefit for the patient. An example of futile outpatient treatment that physicians might decline is a patient’s request for antibiotics to treat a viral infection [4]. While these examples seem straightforward, the concept of futility remains controversial, with some consensus evolving only over time [5].

The literature on how to treat the noncompliant patient is scarce. It could be argued that continuing to recommend treatment to the patient who ignores medical advice or fails to adhere to a prescribed therapy is futile. Before making this determination, however, the physician is obligated to explore reasons for the patient’s noncompliance and exhaust all means for overcoming it. First, the physician should consider whether the patient understands the condition, the recommended therapy, and the consequences of refusing or failing to adhere to the treatment. This is the process of determining a patient’s competency to make health care decisions. Next, the physician should investigate the competent patient’s reasons for refusal or

noncompliance, explain the available alternative therapies or approaches, and become familiar with the patient's ultimate goals for his or her medical care.

Applying these guidelines to our case, Dr. Key must verify that Ms. Miller is indeed competent and possesses appropriate insight into her sleep disorder, the consequences of chronic insomnia, and the treatment options available. Assuming she is competent, the numerous excuses Ms. Miller offers should be closely examined to determine if there are other factors preventing her from considering or implementing the treatment recommendations. Dr. Key should also review the goals of treatment to ensure that he and Ms. Miller are striving for the same outcome. Finally, it is critical for Dr. Key to understand why Ms. Miller continues to schedule clinic appointments when she believes that the advice she is getting is of no benefit. Looking forward to talking to Dr. Key on a regular basis may be more important to her than adequate sleep. If so, that information opens the door to treatment options that may be more effective.

Termination of the Patient-Physician Relationship

If, after all these possibilities have been closely examined and dealt with, the physician determines that the patient's behaviors are contrary to the mutually determined treatment goals, the physician is ethically permitted to inform the patient that he, in this case, is unable to help the patient and is withdrawing from the case. The notification and subsequent procedure must follow the guidelines of termination of the patient-physician relationship as dictated by state laws and medical boards.

According to the American Medical Association (AMA) *Code of Medical Ethics*, a physician is free to choose whom to treat (in nonemergency situations), but once a patient-physician relationship has been established, the physician is obligated to provide the patient with consistent, ongoing care as needed [6]. A patient-physician relationship is considered "established" when a physician provides medical care for an individual, by mutual consent, implied consent (i.e., emergency care) or, rarely, without consent (e.g., a court order). In general, this relationship is expected to be one of mutual respect and collaboration, with patients sharing the responsibility for their health care. In the case discussed above, Dr. Key and his patient, Ms. Miller, have clearly established a patient-physician relationship, so their interactions fall generally under this framework. It appears, however, that their relationship has become dysfunctional and cannot be considered truly collaborative. Is it ethical for Dr. Key to terminate this relationship with Ms. Miller?

The principle of respect for autonomy allows patients the right to accept or refuse any medical treatment offered, so long as they sufficiently understand the consequences of their actions. Hence, patients may choose to terminate the patient-physician relationship for any reason at any time. Physicians may also terminate the relationship, although they must offer the patient a valid reason for their action. Much has been written about how, and for what reasons, a physician may terminate the relationship [7-9], though there is little in the literature about what constitutes a valid reason on the part of the physician. Grounds for termination that could be

considered to meet this standard include the physician's closing his or her practice (e.g., retirement or moving), completion of a care plan with transfer of the patient's care back to the referring physician, a conflict of interest, patient noncompliance, or, perhaps, the physician's decision that aspects of the relationship are not therapeutic and, hence, not in the patient's best interest.

Guidelines for the process of terminating the care relationship have been established by the AMA and adopted in various forms by state and specialty medical societies. These rules have been upheld by the legal system when challenged [10, 11], and it behooves physicians to be aware of their local policies concerning this matter. In general, the policies encourage physicians to give patients advance notice of their plan to terminate the relationship, agree to provide continued care for a "reasonable" time period (often up to 30 days) or until a new physician is found, aid the patient in locating a new doctor, and transfer medical records to the patient's new physician. It is usually recommended that the physician offer an explanation for the termination of the relationship and keep documentation of the notification (e.g., via certified letter with a return receipt).

Assuming Dr. Key's reasons for wishing to terminate his relationship with his patient are valid and reasonable, it would be ethically acceptable for him to do so, provided he has followed the recommended process.

References

1. Goldberg PE. The physician-patient relationship: three psychodynamic concepts that can be applied to primary care. *Arch Fam Med*. 2000;9(10):1164-1168.
2. Zinn WM. Transference phenomena in medical practice: being whom the patient needs. *Ann Intern Med*. 1990;113(4): 293-298.
3. Bernat JL. Medical futility: definition, determination and disputes in critical care. *Neurocrit Care*. 2005; 2(2):198-205.
4. Prendergast TJ. Futility and the common cold. How requests for antibiotics can illuminate care at the end of life. *Chest*. 1995;107(3):836-844.
5. Burns JP, Truog RD. Futility: a concept in evolution. *Chest*. 2007;132(6):1987-1993.
6. American Medical Association. Opinion 10.015 The patient-physician relationship. *Code of Medical Ethics*. Chicago, IL: American Medical Association; 2008. http://www.ama-assn.org/apps/pf_new/pf_online?f_n=browse&doc=policyfiles/HnE/E-10.015.HTM&&s_t=&st_p=&nth=1&prev_pol=policyfiles/HnE/E-9.132.HTM&nxt_pol=policyfiles/HnE/E-10.01.HTM&. Accessed July 24, 2008.
7. American Medical Association. Opinion 8.115 Termination of the physician-patient relationship. *Code of Medical Ethics*. Chicago, IL: American Medical Association; 2008. http://www.ama-assn.org/apps/pf_new/pf_online?f_n=browse&doc=policyfiles/HnE/E-8.115.HTM&&s_t=&st_p=&nth=1&prev_pol=policyfiles/HnE/E-

- 7.05.HTM&nxt_pol=policyfiles/HnE/E-8.01.HTM&. Accessed July 24, 2008.
8. Ohio Administrative Code. Chapter 4731-27-01 Termination of the physician-patient relationship. <http://codes.ohio.gov/oac/4731-27>. Accessed July 24, 2008.
 9. Capozzi JD, Rhodes R, Gantsoudes G. Ethics in practice. Terminating the physician-patient relationship. *J Bone Joint Surg Am*. 2008; 90(1):208-210.
 10. *Hammonds v Aetna Casualty and Surety Co*, 237 F Supp 96,98 (ND Ohio, 1965).
 11. *Kiser v Rubin*, No. 15254, 1995 Ohio App. LEXIS 3928 at slip op 1 (2d App Dist September 8, 1995) (unpublished).

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Related in VM

[Never Symptom-Free](#), April 2003

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CLINICAL CASE

Weighing the Duty to Inform a Patient of Possible Future Illness

Commentary by Shannon Sullivan, MD

Mr. Watts went to see Dr. Pass, a specialist in sleep disorders, because of his history of violent behavior during sleep. Although Mr. Watts didn't have any complaints, his wife was extremely frightened by the episodes of shouting, kicking, and punching that would occur while her husband was sleeping, usually in the early morning hours. After conducting a thorough history and physical exam, Dr. Pass was certain that the diagnosis was idiopathic REM sleep behavior disorder. Although Mr. Watts had always been healthy, Dr. Pass had seen in the literature that, with this diagnosis, Mr. Watts—now 58 years old—had a significant chance of developing a neurodegenerative disease within the next 10-15 years. He wondered whether he should tell Mr. Watts about his risk, given that there was some chance that he would not develop neurodegenerative disease. Whether or not he developed more serious disease later, Mr. Watts, currently an active, working attorney, might experience depression and grief if he were informed of this possibility. To complicate matters even more, there was nothing Mr. Watts or Dr. Pass could do now to prevent or delay onset of the disease.

Commentary

REM sleep behavior disorder (RBD) is a parasomnia that occurs during REM sleep and involves loss of normal REM-related skeletal muscle atonia. It is often associated with motor activity and the acting out of one's dreams [1]. The condition is more common in men than in women and is often characterized by violent behaviors. Those with RBD have more aggressive dreams than those without the disorder, but this tendency does not carry over into the waking hours.

It has been proposed that many patients with "idiopathic" RBD are actually exhibiting early clinical signs of an evolving neurodegenerative disorder [1]. Current data indicate that approximately two-thirds of men aged 50 and older who are diagnosed with this disorder go on to develop Parkinson's disease or a linked condition, dementia with Lewy bodies [2]. The average interval between the onset of RBD and the onset of classic Parkinson's disease is about 13 years, but the time span can vary greatly. Interventions are available to treat the symptomatic manifestations of RBD, but there is no reliable neuroprotective treatment to slow onset or to reduce the risk of Parkinson's disease. Ongoing research in this area could produce such protection within a decade.

Ethical Considerations

Dr. Pass has a duty to make relevant information available to his patient [3]. This is one application of the principle of beneficence—the notion that the practitioner must act in the best interests of the patient. But this same duty to act in the patient’s best interest also invokes the principle of autonomy, which recognizes that competent individuals have a right to make their own health care decisions. Mr. Watts should be informed that his RBD places him at increased risk for being diagnosed with a neurodegenerative disease in the future because it may be important for planning and making decisions about relationships, retirement, finances, and travel. Although there is no neuroprotective treatment available now, Mr. Watts might benefit from discoveries made between the present and the onset of disease, if indeed he falls ill. Without knowledge of his increased risk, he will not be able to take advantage of new interventions should they become available. In these ways, information about his condition is likely to be relevant to Mr. Watts and should be communicated to him. Dr. Pass may also feel that withholding information about a patient’s health status is dishonest, insofar as omission of important details about his risk for disease is akin to avoiding part of the truth, as it is understood among experts in the medical community.

On the other hand, Dr. Pass must balance the duty to inform his patient with the principle of nonmaleficence, the ethics term for “first, do no harm.” One can argue that imposing on Mr. Watts the psychological burden of knowing that he is at increased risk for a neurodegenerative disease associated with dementia is not justifiable. This may be especially true if Dr. Pass has reasonable clinical suspicion that such knowledge will prompt Mr. Watts to develop depression or exacerbate other conditions, such as anxiety, that will impact his overall well-being. There is, after all, a reasonable chance (about 33 percent) that Mr. Watts will not develop neurodegenerative disease. Even if he is diagnosed in the future, the time until onset may be so long as to minimize the beneficial value of being informed now—a type of “future discounting.” If knowledge of disease risk is disclosed now, Mr. Watts will be burdened by the possibility of neurological deterioration at any time. Dr. Pass may deem these considerations, in combination with the lack of available treatment options, as insufficient justification for imposing potential emotional and psychological distress.

Dr. Pass may harm Mr. Watts to some degree either by informing him of the risk or by withholding the knowledge of future disease. Dr. Pass must weigh his duty to avoid psychologically burdening his patient unnecessarily against his duty to be truthful and forthcoming with important information and Mr. Watts’s right to know relevant medical information that may affect his future.

References

1. Boeve BF, Silber MH, Saper CB, et al. Pathophysiology of REM sleep behaviour disorder and relevance to neurodegenerative disease. *Brain*. 2007;130(Pt 11):2770-2788.
2. Schenck C. What do parasomnias tell us about the brain? Presented at: Sleep Research Society Trainee Symposia; June 8, 2008; Baltimore MD.

3. American Medical Association. Principles of medical ethics. *Code of Medical Ethics*. Chicago, IL: American Medical Association; 2008. <http://www.ama-assn.org/ama/pub/category/2512.html>. Accessed July 30, 2008.

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CLINICAL CASE

Giving Medical Testimony in a Patient's Behalf

Commentary by Clete Kushida, MD, PhD

Dr. Carter had known Benji since he was born, taking care of him and his two sisters until they left for college. Over the years and after many visits, Dr. Carter developed a fond relationship with the entire family. Naturally he was shocked to learn through a call from defense lawyers that Benji was being charged with attempted manslaughter. Benji had always been a respectful and conscientious young man; he was the valedictorian of his high school class, the captain of the soccer team, and a volunteer in the Big Brother's program. According to court papers, Benji had thrown his baby from the window in his apartment in the middle of the night. Luckily, the baby survived, but when neighbors heard the commotion, they called the police and Benji was found standing outside the building in his pajamas and was arrested. When police questioned Benji, he had no recollection of the events, claiming that the police had awakened him when they arrived at the scene.

Dr. Carter remembered the many accidents Benji had had when sleepwalking over the years. In addition to a number of bruises and lacerations from the incidents, he once walked into a sliding glass door and sustained injuries that required suturing on his head, face, and arms. Dr. Carter had conducted a thorough neurological work up on Benji to try to explain these bizarre episodes, but never he found any pathology that could cause the sleepwalking. He thought Benji would eventually outgrow the events, as most children do. Dr. Carter remembered Benji fondly, but was hesitant to help in the defense of his case because he couldn't imagine something as benign as sleepwalking resulting in attempted manslaughter. Moreover, he did not want to get involved in the case because he felt it wasn't part of his duty as a physician.

Commentary

Sleepwalking is estimated to occur in up to 4 percent of the adult population, and violent behaviors arising from sleep have been reported in 2 percent of adults [1, 2]. Unusual behaviors during sleep (parasomnias), particularly those associated with violent or injurious behavior, are best managed by a sleep specialist (i.e., a clinician with specialized training in sleep medicine obtained at a center accredited by the American Academy of Sleep Medicine). With respect to Dr. Carter's clinical management of this case, it is curious that he did not refer Benji to a sleep specialist, especially after several sleep-related accidents, one of which caused serious injury.

A Physician's Obligation to Provide Testimony

Turning from the clinical aspect of the case, we confront a physician's uncertainty about how involved he should be in the legal proceedings of his patients. Generally,

physicians can serve the court in a professional capacity by testifying as medical experts or as individuals with the most intimate knowledge of a defendant's medical history.

Expert medical testimony. As a family physician who has no specialty training in sleep disorders, it is unlikely that Dr. Carter qualifies as an expert medical witness. Although he can testify that Benji had incidents compatible with a diagnosis of sleepwalking during his adolescence, cross-examination might reveal that Dr. Carter has observed only a small number of similar cases and that his knowledge and experience with the diagnosis and management of sleepwalking are limited. Were Dr. Carter to be classified as an expert for the defense, there is the possibility that the prosecution could weaken the defense's case by mentioning his failure to seek a referral to a sleep specialist, and they might uncover that Dr. Carter "couldn't imagine something as benign as sleepwalking resulting in manslaughter." Thus, a defendant's having been under the care of a given physician, does not always mean that that physician is an ideal or even competent expert witness in a patient's defense.

General medical testimony. Even though Dr. Carter is not qualified to testify as a medical expert, he is able to provide limited relevant information to the court, particularly since his professional relationship with Benji extended only through the latter's developmental years. The American Medical Association (AMA) position on medical testimony states that, "As citizens and as professionals with specialized knowledge and experience, physicians have an obligation to assist in the administration of justice" [3]. In addition to Dr. Carter's role or duty as Benji's family physician, one could argue that Dr. Carter has an ethical—and even a moral—obligation to help support the claims that Benji has a history of sleepwalking.

The Patient-Doctor Relationship in Court

The patient-doctor relationship extends into the legal sector in that, as stated in the AMA's medical testimony policy:

When a legal claim pertains to a patient the physician has treated, the physician must hold the patient's medical interests paramount, including the confidentiality of the patient's health information, unless the physician is authorized or legally compelled to disclose the information [3].

Thus, if Dr. Carter is called upon to testify, he is legally compelled to disclose Benji's medical information. In this situation, Dr. Carter would have an obligation to discuss his knowledge of Benji's medical history in an objective and independent manner. Further, Dr. Carter might be expected to provide information about Benji's character, even if disclosing such information would damage his patient's defense. Being human, it may be difficult for Dr. Carter to separate emotions or feelings from testimony, but he must make every attempt to give testimony that is as fact based and objective as possible.

Other Considerations

If Dr. Carter is called to testify as an expert witness, he should ask himself whether he has sufficient medical information about Benji or enough knowledge or experience with parasomnias to provide relevant information to the court. If he is being called to give general medical testimony, Dr. Carter should ask himself whether he can separate his fondness for Benji and Benji's family from his duty to supply objective testimony. Does he believe that it is possible that Benji's action could be explained by sleepwalking?

Conclusion

Physicians are highly respected members of society, and their testimony is frequently sought in cases involving medical malpractice, personal injury, or medical conditions that may be responsible for injury or death. In cases attributed to sleep-related violence, medical testimony is becoming the norm rather than the exception. Most physicians are not qualified to provide expert testimony, but they can still be helpful to the court. If they are requested to testify, physicians should carefully consider their obligation in the administration of justice, the patient's medical interests, and their ability to provide testimony that reflects current scientific thought and standards of medical practice. In our case, Dr. Carter's legal role or duty as Benji's family physician is highly dependent on whether he is able to provide relevant, honest testimony in the case, and this decision resides with the defense attorney.

References

1. Hublin C, Kaprio J, Partinen M, Heikkila K, Koskenvuo M. Prevalence and genetics of sleepwalking: a population-based twin study. *Neurology* 1997;48(1):177-181.
2. Mahowald MW, Schenck CH. Violent parasomnias: forensic medicine issues. In: Kryger MH, Roth T, Dement WC, eds. *Principles and Practice of Sleep Medicine*. Philadelphia, PA: Elsevier Saunders; 2005: 960-968.
3. American Medical Association. Opinion 9.07 Medical testimony. *Code of Medical Ethics*. Chicago, IL: American Medical Association; 2008. http://www.ama-assn.org/apps/pf_new/pf_online?f_n=browse&doc=policyfiles/HnE/E-9.07.HTM&&s_t=&st_p=&nth=1&prev_pol=policyfiles/HnE/E-8.21.HTM&nxt_pol=policyfiles/HnE/E-9.01.HTM&. Accessed July 28, 2008.

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MEDICAL EDUCATION

Lack of Training in Sleep and Sleep Disorders

Christopher M. Miller, MD

Primary sleep disorders constitute a significant health problem because of their relatively high prevalence and their potential to adversely affect the morbidity, mortality, and quality of life of those who suffer from them. Sleep complaints are also common in the context of many other diseases. The National Center on Sleep Disorders Research estimates that between 50 and 70 million Americans are affected by a sleep-related problem [1]. In the 2008 Sleep in America poll by the National Sleep Foundation, 65 percent of respondents reported having experienced a sleep disturbance at least a few nights a week in the prior month, and 44 percent reported sleep problems occurring every night or almost every night [2]. The most common sleep disorder—obstructive sleep apnea syndrome—which occurs in 2 percent of women and 4 percent of men over 50—has been linked to conditions such as angina [3], cardiac arrhythmias [4], myocardial infarction [5], stroke [6], and motor vehicle crashes [7]. Importantly, treatments that can improve quality of life and decrease morbidity are available for most sleep disorders.

Given the impact that sleep disorders have on the health and well-being of a significant portion of society, it is remarkable that so little structured, didactic time is given to these topics in the medical school curriculum. This article will examine what is known about sleep medicine and what is taught to medical students and will propose ways of addressing this disparity.

Physicians—regardless of specialty—will inevitably encounter patients with sleep complaints and should have the knowledge and awareness to diagnose them. Unfortunately, despite the common presentation and clinical significance of these conditions, they often go undiagnosed and, consequently, untreated [8, 9]. In the 2005 National Sleep Foundation's Sleep in America poll, 70 percent of respondents reported that their doctor had never asked about their sleep habits or patterns [10].

A likely contributor to physicians' general lack of awareness is the relative paucity of exposure to sleep medicine during medical school. Even when compared to other topics that have been historically underrepresented in the medical school curriculum, such as nutrition and the health benefits of exercise, teaching about sleep is scant.

A national survey of medical school course directors in 1993 found that the average medical school curriculum devoted fewer than 2 hours to sleep and sleep disorders over the four years of medical education [11]. Indeed, 46 percent of the responding medical schools reported allocating no structured didactic time at all to this subject.

More than two-thirds of those who responded rated the time dedicated to sleep education as inadequate [11]. In a follow-up survey in 1998, the average number of hours devoted to sleep medicine instruction improved only slightly to 2.1 hours. Seventy-nine percent of respondents reported spending between 0.75 hours and 2.0 hours on the topic. Twelve percent reported spending between 2.5 and 4 hours, and only 9 percent reported providing 6-10 hours of sleep instruction. Respondents indicated that the greatest need was more instruction time, a tall order for an already crowded curriculum [12].

A 2007 review of medical specialty textbooks found that sleep and sleep disorders information made up only about 2 percent of the content [13]. This lack of emphasis has contributed to the medical culture in which few physicians, other than sleep specialists, ask questions about sleep when taking a patient's history [10].

Recognizing Physician Impairment

Aside from preparing future physicians to care more effectively for their patients, more information about sleep should be included in the medical school curriculum because medical students, residents, and physicians are among those at greatest risk for sleep loss due to their educational and professional obligations. Physicians should know enough about the signs and symptoms of sleep deprivation to assess their own performance and professional behavior [14]. The time to learn about managing the sleep loss that they will endure during residency training is during medical school.

The need for change is clear, but implementing it presents several challenges. The modern medical school curriculum must cover a great deal of material in a limited time, so it is unlikely that a block of curriculum time can be dedicated to sleep medicine instruction. A viable alternative approach is to integrate sleep medicine instruction into the existing curriculum [15, 16]. Harding et al. suggest several ways to do so. Their suggestions include: (1) integrating sleep medicine topics into neuroscience, neuroanatomy, physiology, and behavioral science classes and as case studies in problem-based curricula in the preclinical years; (2) including sleep questions in the history-taking portion of physical diagnosis classes; (3) introducing sleep disorders into clinical correlations classes; (4) introducing computer-based simulations for sleep disorders and their symptoms; (5) integrating sleep topics into internal medicine, neurology, and psychiatry rotations during the clinical years as appropriate; and (6) establishing an elective sleep medicine rotation into the fourth year [15]. Harding et al. also emphasize that, for this approach to succeed, the current curriculum, curricular development processes, and availability of educational resources must be assessed [15].

Conclusion

The gap between what we know about sleep and the limited exposure the average medical student has to that knowledge makes the need for more instruction time devoted to this topic clear. Sleep disorders constitute a significant health problem and, if detected, can generally be treated, improving the health and quality of life for these patients. Medical students should also learn about sleep and sleep loss in order

to regulate their own sleep effectively while they are students and when they become house staff. The challenges of teaching medical students more sleep medicine can best be met by actively integrating information about sleep and sleep disorders into the existing medical school curriculum. Increasing awareness of sleep disorders among nonspecialists could improve the rate of diagnosis of these treatable disorders.

References

1. National Sleep Disorders Research Plan. *Sleep*. 2003;26(3):253-257.
2. National Sleep Foundation. *2008 Sleep in America Poll Summary of Findings*. Washington, DC: National Sleep Foundation; 2008.
<http://www.sleepfoundation.org/atf/cf/%7Bf6bf2668-a1b4-4fe8-8d1a-a5d39340d9cb%7D/2008%20POLL%20SOF.PDF>. Accessed July 21, 2008.
3. Wei K, Bradley TD. Association of obstructive sleep apnea and nocturnal angina [abstract]. *Am Rev Respir Dis*. 1992;145(4 pt 2):A433.
4. Guilleminault C, Connolly SJ, Winkle RA. Cardiac arrhythmias and conduction disturbances during sleep in 400 patients with sleep apnea syndrome. *Am J Cardiol*. 1983;52(5):490-494.
5. Hung J, Whitford EG, Parsons RW, Hillman DR. Association of sleep apnea with myocardial infarction in men. *Lancet*. 1990;336(8710):261-264.
6. Partinen M, Guilleminault C. Daytime sleepiness and vascular morbidity at seven-year follow-up in obstructive sleep apnea patients. *Chest*. 1990;97(1):27-32.
7. Aldrich MS. Automobile accidents in patients with sleep disorders. *Sleep*. 1989;12(6):487-494.
8. Kapur V, Krohl KP, Redline S, Iber C, O'Connor G, Nieto J. Underdiagnosis of sleep apnea syndrome in U.S. communities. *Sleep Breath*. 2002;6(2):49-54.
9. Rosen RC, Zozula R, Jahn EG, Carson JL. Low rates of recognition of sleep disorders in primary care: comparison of a community-based versus clinical academic setting. *Sleep Med*. 2001;2(1):47-55.
10. National Sleep Foundation. *2005 Sleep in America Poll Summary of Findings*. Washington, DC: National Sleep Foundation; 2005.
http://www.kintera.org/atf/cf/%7BF6BF2668-A1B4-4FE8-8D1A-A5D39340D9CB%7D/2005_summary_of_findings.pdf. Accessed July 30, 2008.
11. Rosen RC, Rosenkind M, Rosevar C, Cole WE, Dement WC. Physician education in sleep and sleep disorders: a national survey of U.S. medical schools. *Sleep*. 1993;16(3):249-254.
12. Rosen R, Mahowald M, Chesson A, et al. The Taskforce 2000 survey on medical education in sleep and sleep disorders. *Sleep*. 1998;21(3):235-254.
13. Teodorescu MC, Avidan AY, Teodorescu M, et al. Sleep medicine content of major medical textbooks continues to be underrepresented. *Sleep Med*. 2007;8(3):271-276.
14. Papp KK, Miller CM, Strohl KP. Graduate medical training, learning, relationships, and sleep loss. *Sleep Med Rev*. 2006;10(5):339-345.

15. Harding SM, Berner ES. Developing an action plan for integrating sleep topics into the medical school curriculum. *Sleep Breath*. 2002;6(4):155-160.
16. Gamaldo CE, Salas RE. Sleep medicine education: are medical schools and residency programs napping on the job? *Nat Clin Pract Neurol*. 2008;4(6):344-345.

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JOURNAL DISCUSSION

Language, Print Media, and Medicalization of Sleep Disorders

Christian J. Krautkramer, MPH

Kroll-Smith S. Popular media and ‘excessive daytime sleepiness’: a study of rhetorical authority in medical sociology. *Sociology of Health and Illness*. 2003;25(6):625-643.

Seale C, Boden S, Williams S, Lowe P, Steinberg D. Media constructions of sleep and sleep disorders: a study of UK national newspapers. *Social Science and Medicine*. 2007;65(3):418-430.

The typical American consumer is inundated with advertisements and media reports suggesting that this or that physical or mental annoyance is a diagnosable medical disorder. Beyond the tremendous amount of televised direct-to-consumer advertising—nearly \$60 billion in the United States in 2004 [1]—drugs are also publicized in reports on medical research and clinical trials carried by print and broadcast media. Research findings are frequently highlighted in press releases and interpreted in interviews with pharmaceutical industry representatives who frame a given drug as a cutting-edge treatment for an ailment that, 2 years earlier, might not have been classified as a disorder. Life’s occasional discomforts—sadness, twitchy legs, decreased sex drive—have recently become chronic pathologic ailments called depression, restless legs syndrome, and sexual dysfunction. While some people may indeed suffer these discomforts to a degree that interferes significantly with their lives and warrants clinical intervention, many others are being prompted to seek medical treatment unnecessarily.

Medicalizing Sleep Disorders

Among the most widespread and controversial of these medicalized conditions are sleep disorders. Be it an inability to obtain quality sleep at night or extreme sleepiness when one is supposed to be awake, millions of Americans experience some irregularity in their sleep. Two articles in sociology journals examined the quantity and quality of sleep and sleep disorder reports in the media—TV, newspapers, magazines, and, more recently, web sites—from which most people get their health-related information. Recognizing that the boundaries between reports of medical research and popular commentary on research findings are porous and that people are more likely to absorb information from popular than from scientific sources, sociologist Kroll-Smith takes a particular interest in the language the media use to describe sleep disorders [2]. He believes that the sense of authority readers perceive from these popular media reports can have as great an effect—or greater—

on their opinions about a medical or medicalized condition than information from an expert source [2].

Kroll-Smith believes further that such real and perceived rhetorical authority presents a problem when readers accept it as professional advice. In the case of sleep, he dates characterization of sleepiness as a medical disorder at around 1982, when the media picked up an article in the *Journal of the American Medical Association (JAMA)* stating that 51 percent of a surveyed population reported suffering from “excessive daytime sleepiness” [3]. National media outlets jumped on the story and circulated it widely. In subsequent months, several other publications—among them *Psychology Today*, *Businessweek*, *U.S. News & World Report*—extrapolated from the *JAMA* research and described excessive sleepiness as a nationwide problem with titles like “A Nation of Sleepy Heads” and “The Drowsy Crowd” [4]. These articles also started the trend of clustering groups of symptoms of excessive sleepiness into a definable disorder, problem, or syndrome. Kroll-Smith argues that the way in which these symptoms are characterized and clustered—the language of illness, as it were—is key in determining whether someone classifies a physical condition under the terms of the disorder or syndrome. Thus sleepiness moves simply from “unwelcome somatic state” to “distinct medical disorder” [5].

Kroll-Smith continues with a history of how “problem” sleepiness is reported, suggesting a rise in the number of articles on sleepiness both in publications for general readership (newspapers and newsweeklies, for example) and in those intended for specific readers (women’s or men’s magazines, parenting magazines, nonscientific medical interest publications) throughout the 1990s. [6] With the advent of the Internet, even more opportunities opened for individuals to diagnose themselves with a medicalized form of excessive sleepiness.

The author speculates that weightiness or severity in a story increases its rhetorical authority. For example, a newspaper article claiming that highway deaths are caused by problem sleepiness is more persuasive than one suggesting that problem sleepiness causes 10 minutes of lost productivity a day. Further rhetorical authority accrues when the cluster of symptoms is classified as a clearly titled, medically diagnosable disorder—such as excessive daytime sleepiness, or EDS [7]. Classifying disorders in an easily communicated way (i.e., via acronym) gives patients the power to (a) claim illness by name and (b) ask for medicine to treat it, generally a prescription drug.

Matching Language and Content to Readers

Our friends in Great Britain are no less immune to sleepiness or its classification as a diagnosable and treatable medical condition. And they are equally inundated with media reports telling them they are problem sleepers. Seale and colleagues use the rhetorical basis established by Kroll-Smith to examine how sleep disorders have been presented by the British press [8]. Much like Kroll-Smith, Seale et al. believe that the press has played a major role in the medicalization of unwanted physical or mental states, along with what they refer to as “healthicisation,” the notion that

people perceive the maintenance or restoration of health as a responsibility of good citizenship.

But Seale et al. go further, believing that media reporting “personalizes” messages to specific reader segments, better enabling them to understand the problem, determine whether it applies to them, and, if it does, craft a strategy for coping with or managing the problem. For example, the authors say that women, as a group, have always had to cope with sleep disorders due to the multiplicity of their social roles [9].

Seale et al. believe that tailoring descriptions of health-related conditions to a particular reader segment through careful crafting of news headlines and their accompanying stories is endemic in British newspapers. They examined 1,051 articles from five London-published newspapers over a 21-year period, all of which included the word “sleep” (or a variant) in the headline or first paragraph. Two newspapers (the *Times* and the *Guardian*) were considered serious press and three papers (the *Sun*, the *Mirror*, and the *Mail*, which has a considerably larger female readership than the other papers) represented the tabloid press [10]. Using a comparative keyword analysis, the authors determined patterns in language that suggest the personalization of readership: serious papers had headlines and articles that used “elaborated language of argumentation and evidence, with more complex sentence structures,” whereas tabloids used “frequent personal pronouns,” slang, informal language and grammar, and frequently included references to “sex, football (soccer), TV, and celebrity” [11].

The study’s findings indicate that, in newspapers that personalize, there are clear differences in the content as well as in grammar and style. Articles in serious papers frequently discussed the science of sleep or the medical research related to sleep and sleep disorders, including pharmacotherapy that might help the afflicted enjoy better sleep. These articles also indicated that sleep disorders could decrease one’s productivity or interrupt work or home responsibilities [12]. Tabloid articles, on the other hand, tended to skirt scientific discussions, choosing instead sales pitches for nonpharmaceutical products that might help improve sleep. These articles also included more anecdotal musings about why one might experience increased sleepiness and fewer discussions about how improving sleep management might increase productivity in daily life. Tabloids also printed many more stories that revolved around a misfortune—often injury or death—that befell someone or loved ones who were experiencing sleep-related problems [12]. The authors’ examination of the *Mail* alone, with its considerable female readership, revealed that articles frequently related sleep, its importance, and the problems associated with sleep disturbance to ideas of families, parenting, caregiving, consumer products tailored for women, and beauty or body-image tips [13].

While they do not offer concrete measures for avoiding these rhetorical constructions in popular media, Seale and colleagues do suggest that we, as readers, not be so

naive as to think that what we are reading is not pure reporting and instead recognize that it is carefully crafted to reflect our own personal views and values.

References

1. Gagnon MA, Lexchin J. The cost of pushing pills: a new estimate of pharmaceutical promotion expenditures in the United States. *PLOS Medicine*. 2008;5:e1.
2. Kroll-Smith S. Popular media and ‘excessive daytime sleepiness’: a study of rhetorical authority in medical sociology. *Sociology of Health and Illness*. 2003;25(6):626-627.
3. Kroll-Smith, 628-630.
4. Kroll-Smith, 631.
5. Kroll-Smith, 636.
6. Kroll-Smith, 635.
7. Kroll-Smith, 637.
8. Seale C, Boden S, Williams S, Lowe P, Steinberg D. Media constructions of sleep and sleep disorders: a study of UK national newspapers. *Social Science and Medicine*. 2007;65(3):418-430.
9. Seale et al., 420.
10. Seale et al., 421.
11. Seale et al., 422.
12. Seale et al., 424-425.
13. Seale et al., 427-428.

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CLINICAL PEARL

Causes, Symptoms, and Diagnosis of Obstructive Sleep Apnea

Nitun Verma, MD, MBA

The signs and symptoms of obstructive sleep apnea can be divided into those that are present during or around sleep and those that occur while one is awake. The pathological mechanism involved is partial or complete occlusion in the nasopharynx and oropharynx that results in a complete or partial arousal of the nervous system that then reopens the airway. Multiple arousals and oxygen desaturations produce symptoms of obstructive sleep apnea (OSA). These nervous system arousals manifest as restless sleep—an affected person can be seen tossing and turning during sleep. Snoring is often associated with this condition but is not always present. More severe cases can cause someone to wake gasping for air. This shortness of breath quickly resolves once the individual wakes [1]. An autonomic (sympathetic) activation that results in a sudden awakening can lead to palpitations, sweating, or even panic. The nature of these arousals can make it difficult to fall back to sleep, and this “maintenance insomnia” is a common complaint in someone who is later diagnosed with OSA. Since many of these symptoms occur during sleep, a bed partner is often the first to notice that something is wrong.

After an affected person wakes, the symptoms are multiple and varied. People who experience fragmented sleep can wake unrefreshed in the morning, even if they had an acceptable total number of hours of sleep. The multiple arousals and potential oxygen desaturations can also cause morning headaches. Inadequate sleep can produce daytime sleepiness that manifests first during quiet activity, such as reading or riding in a car as a passenger [1]. As the condition progresses, sleepiness affects other, more active pursuits, such as driving [2]. Decreased attention, memory, and focus can occur, and studies show that sleepy people tend to have more negative moods than rested people [3, 4].

Diagnosing OSA

OSA is diagnosed through history taking, physical exam, and diagnostic studies. The history should detail events during sleep and wake periods, with attention to the above-named experiences. The physical exam seeks to identify factors that can compromise the airway and increase the likelihood of its collapsing during sleep when the muscles surrounding the airway relax. These factors include a large neck (of over 40 cm [5]), obesity, large tongue, and large tonsils (grade 3 or more). Anatomical features that make the maxillae and mandible too small for soft tissue anatomy should also be examined. A high arched palate and a high mallampati score can increase the chances that an airway will collapse. Retrognathia and micrognathia

can also result in an abnormal overjet (i.e., the lower incisors are behind the upper incisors) that can easily be seen in exam [6].

The gold standard for diagnosis is the overnight polysomnogram, which takes place during an overnight stay in a sleep laboratory with sensors placed on the upper lip to assess air movement and listen for snoring. Electrodes on the head and near the eyes help physicians identify the stages of sleep the patient is in and, even more importantly, assess arousals from sleep. The heart is monitored by EKG and oxygen probe. Sensors are also placed on the body to detect muscle activity. The number of arousals from apneas and hypopneas result in an index (AHI) of the number of times apneas and hypopneas occur per hour. More than five per hour in association with daytime sleepiness requires treatment. There is debate in the sleep field about whether there are circumstances in which a less comprehensive study done at home would suffice. Those with histories of sleep disturbance who have anatomical features that can compromise the airway should be tested for OSA. When the diagnosis is confirmed, physicians should assess its severity and collaborate with the patient on a treatment plan.

References

1. Kales A, Cadieux RJ, Bixler EO, et al. Severe obstructive sleep apnea—I: Onset, clinical course, and characteristics. *J Chron Dis*. 1985;38(5):419-425.
2. Findley LJ, Unverzagt ME, Suratt PM. Automobile accidents in patients with obstructive sleep apnea. *Am Rev Respir Dis*. 1988;138(12):337-340.
3. Bedard MA, Montplaisir J, Malo J, Richer F, Rouleau I. Persistent neuropsychological deficits and vigilance impairment in sleep apnea syndrome after treatment with continuous positive airways pressure (CPAP). *J Clin Exp Neuropsychol*. 1993;15(2):330-341.
4. Naegele B, Thouvard V, Pepin JL, et al. Deficits of cognitive executive functions in patients with sleep apnea syndrome. *Sleep*. 1995;18(1):43-52.
5. Kushida CA, Efron B, Guilleminault C. A predictive morphometric model for the obstructive sleep apnea syndrome. *Ann Intern Med*. 1997;127(8 Pt 1):581-587.
6. Jamieson A, Guilleminault C, Partinen M, Quera-Salva MA. Obstructive sleep apnea patients have craniomandibular abnormalities. *Sleep*. 1986;9(4):469-477.

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HEALTH LAW

Role of the Expert Witness in Sleep-Related Violence Trials

Michel A. Cramer Bornemann, MD

“Parasomnia” refers to unusual behavior, especially violent or injurious acts, associated with sleep. The term is invoked increasingly in the hope of absolving someone accused of violent nocturnal behavior from criminal and civil liability. In such cases, a sleep medicine specialist may be invited by law enforcement agencies, the legal community, or both to assist in the criminal investigation or to render a medical opinion about these often bizarre behaviors. It is thought that if these complex behaviors were performed while the person accused of the acts was still technically asleep then they were performed without consciousness or full awareness. In this way the defense team is able to develop a “sleepwalking defense” under the guise of classic automatism. This latter maneuver was first introduced in the British House of Lords around 1843 under the M’Naghten Rules and formulated upon the compassionate principle that it is morally wrong to punish an individual who is deprived, either permanently or temporarily, of the intent that is necessary for the act to be defined as a crime.

It is likely that violence during the sleep period is more frequent than previously assumed. In one study, 2 percent of the adults surveyed reported violent behaviors arising during the sleep period [1], and there is growing appreciation that abnormal sexual behaviors, described as “sleepsex” or “sexsomnia,” can emerge during sleep. In a comprehensive review on sleep-related disorders and abnormal sexual behaviors published in *Sleep*, Schenck et al. listed a broad range of sleep-related behaviors with self, bed partners, or others that included masturbation, sexual vocalizations, fondling, sexual intercourse, sexual assault, and ictal sexual hyperarousal [2].

A Case of Sexual Assault Attributed to Parasomnia

A legal case will help me illustrate the role of an expert physician in sleep-related violence trials.

Early on a Sunday morning, the county sheriff responded to a 911 call in reference to alleged sexual battery of a minor. According to the sworn statement, a 12-year-old girl had spent the previous evening at the home of her best friend who served as her witness in the complaint. The victim said that she fell asleep at 1:15 a.m. on the couch in front of the television in the living room while her friend slept on a nearby couch. She awoke suddenly at 4:30 a.m. to the feeling of someone touching her inner thighs but, thinking she had been dreaming, quickly fell back to sleep. A few moments later she awoke again and became aware enough to realize that her legs had

been placed on top of the lap of a 25-year-old male whom she later accused of assault. The accused was an acquaintance whom she had encountered only infrequently in large social gatherings and who sometimes spent the night at the house where the assault took place after drinking with the victim's best friend's father.

Realizing that she was being sexually assaulted—the young man was touching her genitals under her clothes—the victim jumped off the couch and rushed over to tell her friend that she had just been molested. Shortly thereafter both the victim and witness confronted the young man who stated that he had no recollection of the episode. According to the victim, the man later told her that he must have “passed out,” and would “never drink again for as long as I live.”

The man was arrested and charged with criminal sexual assault against a minor. Conviction on that charge could mean a prison sentence of 18 years or more. His defense attorney learned through the defendant's mother that he had a history of sleepwalking that had begun in early childhood. The behaviors she described appeared to have the characteristics of classic childhood somnambulism, leaving little doubt that the accused had experienced the condition at some point in his lifetime. His nocturnal forays had diminished significantly in adulthood and had never taken on a sexual nature. The mother said that every male on the paternal side of the defendant's family for generations had an “extreme sleepwalking” condition.

Armed with this information, the defense attorney located a physician who operated a private sleep laboratory nearby and asked if he would help develop a sleepwalking defense. This physician reviewed the case documents, but never examined the defendant. Nonetheless, the physician emphatically and absolutely supported the defense attorney's premise and provided an opinion based on the accused's predisposition for sleepwalking, adding that alcohol had been the immediate trigger for the sleepwalking event.

As the lead investigator of Sleep Forensics Associates at the Minnesota Regional Sleep Disorders Center, I was approached by the prosecutor of the state attorney's office to review the case without bias and attempt to function in the role of *amicus curiae* in a precourt setting. It was assumed that, because I had access to all of the criminal and legal documents to this case, I would be able to either refute or support the sleepwalking defense and thereby provide direction for the state prosecutor.

Proposed Neuroscientific Mechanism of Parasomnia

The fact that violent behaviors can arise in the absence of conscious wakefulness raises crucial questions about the physiologic mechanism of such complex behaviors—a matter of pivotal concern when assigning degrees of culpability in a court of law. Though the pathophysiology of parasomnias remains incomplete, recent observations in neuroscientific studies involving central pattern generators and memory impairment secondary to alcoholic blackouts offer valuable clues.

Central Pattern Generators (CPGs). First of all, the widely held concept that the brainstem and other “primitive” neural structures participate primarily in rudimentary but not in complex behavioral activities has been shown to be inaccurate. There is substantial evidence that highly complex emotional and motor behaviors can originate from these more primitive structures without involvement of more rostral neural structures. The dissociation of behavior from consciousness and higher-level executive functions may be explained by the presence of locomotor centers, from the mesencephalon to the medulla, that are capable of generating complex behaviors without cortical or frontal lobe input. These areas project to spinal cord CPGs, which are able to produce complex movements in the absence of supraspinal influence, and CPGs are close to a number of brainstem sleep generators.

Secondly, despite arbitrary parameters in sleep laboratories that place sleep within clearly defined boundaries measured by EEG criteria, developments in neuroscience emphasize that the brain is in a perpetual state of flux—perhaps never strictly in a declared state, at least in the traditional sense. Because similar patterns of clinical expression are observed in different parasomnias, Tassinari hypothesizes in a unique neuroethologic approach that the various behaviors are generated by CPGs released through different mechanisms triggered during transitions between sleep states [3].

Alcoholic Blackouts. Alcoholic blackouts are often misunderstood, and their involvement in antisocial behavior is often underappreciated. The blackouts are episodes of amnesia during which an individual is capable of participating in salient, emotionally charged events that he or she does not remember later. Alcohol impairs one’s ability to form memories while intoxicated, but does not erase memories formed before the toxic insult. An alcoholic blackout may present as a Korsakoff-like syndrome that goes undetected by both law enforcement officers and health care staff who are not trained to evaluate this type of cognitive impairment.

Risks associated with alcoholic blackouts are influenced by physiologic factors that affect alcohol distribution and metabolism, such as percent of body fat and levels of key enzymes. The rate of increase in blood alcohol concentration (BAC) (rather than the absolute value of BAC) is closely linked to blackout events [4]. Alcoholic blackouts are no longer the domain of the chronic alcoholic in the lower economic strata. Several recent studies have shown a surprisingly high prevalence of such blackouts among social drinkers and college-age individuals [5]. Subsequent studies of college students reported a high prevalence of risky behaviors during blackouts, including sexual activity with acquaintances and strangers, vandalism, and fighting [6].

Alcohol and Memory. Recent research using animal models has shown that alcohol profoundly suppresses the activity of pyramidal cells in the region of the hippocampus that has been associated with ability to form new explicit memories [7]. Much is known about the effects of alcohol on decrements in motor performance, and there is also compelling evidence to indicate that acute alcohol use impairs the performance of frontal lobe-mediated tasks such as those that require

judgment and impulse control [8]. Appreciating the neuroscience of alcoholic blackouts allows one to better understand the mechanisms of behaviors that may proceed without consciousness, awareness, and proper executive function. The alcoholic blackout also clearly represents one of the many behaviors that can mimic parasomnia behaviors. The former are exponentially more prevalent and thus should be given appropriate weight when attributing likely causation in criminal allegations.

Medico-Legal Considerations

Anglo-American law has traditionally defined criminal offenses as requiring both an *actus reus* and a *mens rea*. Essentially, *actus reus* is the physical part of the offense while *mens rea* defines the required state of mind. The state must prove both that the accused performed the act and that he or she intended to do so while knowing the natural and probable consequences of the act. Regrettably, it has proven exceedingly difficult to establish either the precise meaning of these terms or the relationships connecting them. The American Law Institute's Model Penal Code (MPC) provides some guidance to these difficult relationships, requiring culpability for each material element of the offense.

Generally, the state satisfies its burden to prove culpability only if it establishes that the defendant acted purposely, knowingly, recklessly, or negligently regarding each material element of the offense. Here the psychological states of the defendant are relevant to the voluntary act and culpability requirements, as well as to the development of certain general defense strategies. The MPC, which was first officially recommended by the American Law Institute in 1962, was heavily influenced by post-World War II Freudian psychoanalytic theory and a relatively static perception of consciousness—concepts that are out of step with contemporary thought and certainly not consistent with advances in neuroscience since 1970 [9]. Though certain defenses, such as the insanity defense and automatism (i.e., the sleepwalking defense) remain relevant to criminal liability, the outdated MPC constructs, in combination with the inability to sufficiently define “consciousness,” or for that matter even “voluntariness,” lead to a theoretical foundation of defenses within the legal context that remains contentious and is a virtual minefield for even the well-equipped medical expert to tread upon.

Legal scholars recognize several general categories of defenses that provide protection from criminal liability. Automatism generally invoke the excuse defense—the defendant claims that he lacks culpability due to his “psychological” state at the time of the offense and was unable to appreciate the wrongfulness of his act. Legal scholars contend that the excuse must involve a disability that the actor has that causes the excusing condition. This disability must be confirmed on the basis of observable indicators (excluding the conduct from which the actor is seeking to be excused) [10]. Unfortunately current scientific and clinical understanding often cannot satisfy the legal community's demand for concrete confirmation and observation of the excusing condition. When applied to sleep medicine, for example, there is no after-the-fact polysomnographic (PSG) finding that can have relevance to

determining whether or not the accused was sleepwalking at the time of the alleged event [11].

Ethical Directives for Giving Legal Testimony

To render an expert opinion in a case of an alleged sexual assault of a minor like the one I described earlier, one must have knowledge of the current developments in neuroscience that explain how behaviors (and not just violent parasomnias) may occur without complete awareness, as well as an understanding of the limitations and controversies surrounding the MPC demands, particularly those related to automatism. Because a diagnostic polysomnograph can neither refute nor support a suspected diagnosis, and given the transitory nature of brain states, the presence or absence of a condition can never be determined with absolute certainty. Ultimately, the best the medical expert can do is to provide an opinion that the condition is either “highly unlikely,” “likely,” or “highly likely,” or that there are “insufficient data to assess likelihood.” A savvy medical expert should advise the legal team to consider introducing additional exhibits, such as functional neuroanatomical charts, into the courtroom as scientific presentations which lend credence to the final rendered opinion. For his part, the sleep medicine expert should adhere to the principle of “behavior isolation,” that is, he or she should stick to judging the likelihood that the behavior in question is a parasomnia based upon the merits of the characteristics of the behavior itself, and, despite temptation to do so, should not venture into matters of psychology, intent, or lack of intent [12].

The medical expert has to render opinions that are based upon published, clinically based evidence and peer-reviewed medical literature. To deviate from this standard would be misleading and ethically questionable and could circumvent the jury system that relies upon objective information in difficult medico-legal cases. In the case of alleged assault that I am discussing, the defense attorney hired a medical expert who supported the sleepwalking defense based primarily upon the premise that alcohol ingestion was the immediate trigger for the event. A recent thorough review of the scientific literature reveals, however, that there is no direct experimental evidence that alcohol predisposes or triggers sleepwalking or related disorders [13]. It is my belief that the sleepwalking defense should only be considered after other conditions have been exhausted and that consideration should be first given to the relative risks of violence and sexual crimes following episodes of clear alcohol intoxication. The estimate that alcohol alone is five million times more likely to cause violent behavior than sleepwalking is a conservative one.

Finally, claims of alcohol-induced parasomnias presented solely to circumvent the laws of voluntary intoxication should be understood for what they are and judged accordingly. It is not the role of the medical expert to win the case for the team who hired him, though it is not uncommon for medical experts to use irrelevant and disingenuous technicalities in attempts to deceive and secure the decision. Instead, the salient ethical decision for those who assume the mantle of medical expert is to recognize and value the privileged role of educator granted to physicians within the legal process, promote recently published, peer-reviewed science, and minimize bias

while rendering an opinion. The weight of the decisions of either guilt or innocence should never rest in the hands of medical experts whose task is to contribute to the due process of a functional legal system by ensuring that the jury is educated and well-informed.

References

1. Cramer Bornemann MA, Mahowald MW, Schenck CH. Forensic sleep medicine issues: violent parasomnias. In: Smith HR, Comella CL, Hogl B, eds. *Sleep Medicine*. New York, NY: Cambridge University Press; 2008:240-255.
2. Schenck CH, Arnulf I, Mahowald MW. Sleep and sex: what can go wrong? A review of the literature on sleep related disorders and abnormal sexual behaviors and experiences. *Sleep*. 2007;30(6):683-702.
3. Tassanari CA, Rubboli G, Gardella E, et al. Central pattern generators for a common semiology in fronto-limbic seizures and in parasomnia. A neuroethologic approach. *Neurol Sci*. 2005;26(suppl 3):s225-s232.
4. Goodwin DW, Othmer E, Halikas JA, Freeman F. Loss of short-term memory as a predictor of the alcoholic blackout. *Nature*. 1970;227(5254):201-202.
5. Wechsler H, Lee JE, Kuo M., Seibring M, Nelson TF, Lee H. Trends in college binge drinking during a period of increased prevention efforts. Findings from 4 Harvard School of Public Health College Alcohol Study surveys: 1993-2001. *J Am Coll Health*. 2002;50(5):203-217.
6. White AM, Jamieson-Drake DW, Swartzwelder HS. Prevalence and correlates of alcohol-induced blackouts among college students: results of an e-mail survey. *J Am Coll Health*. 2002;51(3):117-131.
7. White AM, Matthews DB, Best PJ. Ethanol, memory and hippocampal function: a review of recent findings. *Hippocampus*. 2000;10(1):88-93.
8. Weissenborn R, Duka T. Acute alcohol effects on cognitive function in social drinkers: their relationship to drinking habits. *Psychopharmacology (Berl)*. 2003;165(3):306-312.
9. Denno DW. Crime and consciousness: science and involuntary acts. *Minn Law Rev*. 2002;87(2):269-400.
10. Schopp RF. *Automatism, Insanity, and the Psychology of Criminal Responsibility: A Philosophical Inquiry*. New York, NY: Cambridge University Press; 1991.
11. Mahowald MW, Schenck CH, Cramer Bornemann MA. Finally—sleep science for the courtroom. *Sleep Med Rev*. 2007;11(1):1-3.
12. Cramer Bornemann MA, Mahowald MW, Schenck CH. Parasomnias: clinical features and forensic implications. *Chest*. 2006;130(2):605-610.
13. Pressman MR, Mahowald MW, Schenck CH, Cramer Bornemann M. Alcohol-induced sleepwalking or confusional arousal as a defense to criminal behavior: a review of scientific evidence, methods and forensic considerations. *J Sleep Res*. 2007;16(2):198-212.

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POLICY FORUM

Keeping Sleepy People off the Road: The Responsibility of Drivers, Doctors, and the DMV

Kingman P. Strohl, MD

Automobile crashes are the third leading cause of death and injury in the United States, with nearly 43,000 people killed in approximately 6 million accidents in 2006, according to National Highway Traffic Safety Administration statistics [1]. Over the years the ratio of the number of crashes and severity of injury to miles driven is consistently highest in younger drivers (15 to 25 years) and in those over the age of 65 [2, 3]. The most frequent contributors to these statistics are speeding and alcohol, but inattentiveness, fatigue, and sleepiness are now recognized as significant primary and secondary factors [3].

While one can be inattentive or fatigued without being sleepy, sleepiness increases the risk of crashing substantially and, subsequently, increases the likelihood of excessive injury and mortality significantly [4, 5]. Sleepiness to the degree that impairs driving may be a consequence of shorter sleep periods and longer hours of service, as in post-graduate medical training. Sleepiness is also associated with a variety of medical disorders. An individual's sleepiness is now considered a predictable—and therefore preventable—public health risk; a visit to a licensed health care practitioner can uncover the risk so that it can be properly managed. As a result, society is beginning to hold individuals accountable when their sleepiness at the wheel causes an accident and injury [6].

Sleepiness

Sleep is generally defined as a normal, rapidly reversible, brain-based, inattentive state. The opposite state is wakefulness, and transitions between the two occur normally, often in concert with circadian rhythm. Sleep is homeostatically regulated—lack of sleep increases the tendency for sleep to occur, and a surfeit of sleep promotes wakefulness. In the general population, lack of sufficient sleep to maintain alertness during the day is most often due to a lifestyle choice to sleep fewer hours than needed to sustain maximum alertness. Habits that contribute to poor sleep include the use of alcohol, nicotine, and drugs. Long hours of work—especially shift work—can also lead to poor or inadequate time for sleep.

Lack of sleep has an objective impact on functioning. A healthy person who stays awake for 18 hours has a deficit in reaction time equivalent to that of a person with an alcohol level that, in most states, would define that person as impaired [7]. The most common medical cause of daytime sleepiness is obstructive sleep apnea, which is also linked to incidence of automobile crashes [3]. Disorders such as narcolepsy

and pharmacological therapies such as antihistamines and sedating drugs for treatment of anxiety can produce sleepiness or compound the effects of insufficient sleep to a degree that can interfere with the operation of a motor vehicle.

This discussion will focus on the interface between medical practice and society in regard to the detection, treatment, and management of drivers with sleepiness.

The Driver

Experiencing excessive sleepiness is common, but I do not think the personal and societal impact of driving in this condition has reached the level of societal awareness that the consequences of alcohol use or epilepsy have achieved. Dangerous levels of sleepiness may not be recognized by the driver, his or her family, or even the physician. Nevertheless, each driver is obligated to act responsibly as a citizen and as a patient [8]; that is, to comply with existing laws and regulations, including contractual relationships with an employer and insurance providers, and to disclose medical illness that may affect driving ability. A driver-patient who has or is asked about problem sleepiness or symptoms of a sleep disorder is expected to disclose relevant information honestly [9]. A driver who withholds such information increases the possibility of incurring penalties and causing injuries to others, in addition to increasing his or her own personal risk.

Once a risk of excessive sleepiness is disclosed to a physician—either by verbal report or by the driver's having had a crash or near miss after falling asleep at the wheel—that driver has an obligation to respond and adhere to medical recommendations. While the risk of crashes is high in undiagnosed sleep disorders, it falls back into normal range after the disorder is diagnosed and managed clinically, most likely due to alterations in driving habits and behaviors that come with information about the diagnosis.

The Physician

Although physicians must attempt to identify risks from excessive sleepiness and reduce the possibility that the patients will harm themselves in any way [10], they cannot be held responsible for information that is not readily apparent on a clinical examination or that is not disclosed by the patient. Neither is the physician trained in driving safety or empowered to license drivers, but it is assumed that a prudent, trained physician can identify the risks of a medical condition or medication that are liable to produce sleepiness. A physician who prescribes hypoglycemic medications, sedatives, or other medications that can affect driving performance has an obligation to warn drivers of the effects those drugs may have.

If a patient's disorder poses a danger to other people, the physician has a duty to act to reduce the risk of harm to others by reporting the patient to a licensing bureau and recommending that his or her driving privileges be revoked. This duty may be applicable not only in the case of those who are taking prescribed sedative medication but also of those with seizure disorders. Physicians are expected to reach their judgments on the basis of: (a) records and information obtained in the course of

a normal medical evaluation, and (b) their expertise and experience in assessing intermediate, foreseeable markers of crash risk.

Physicians can be held liable for injuries to third parties when it can be shown that they failed to acknowledge impairments in driving performance and that this failure was a cause of the injury [11, 12]. Claims have been paid to injured parties because of a physician's failure to warn of the side effects of a sedative medication [10]. These background duties under tort law may be supplemented by statutory obligations in each state to report the names of patients who have disorders or are taking medications that pose a risk to driving safety.

What are a physician's responsibilities vis a vis patients who report symptoms of sleepiness or disorders where sleepiness may pose the risk of an automobile crash? The answer is complicated. First, there is debate over the standard of care. Even among those with advanced subspecialty training in sleep medicine who are certified to conduct examinations of commercial drivers or airline pilots, there is ongoing debate about how best to recognize sleepiness (it is a subjective complaint) and how to test and warn patients of sleepiness risk. Among those without such expertise, the situation is worse; formal training in the recognition and management of sleep disorders and sleepiness is spotty. Given the absence of reliable tests and the lack of sleep education during medical training, the current thinking is that general practitioners and those in surgical and medical specialties other than sleep medicine are not able to assess sleepiness reliably or to respond to statutory directives in an informed manner.

Second, there is the challenge of monitoring patient compliance with physician recommendations [10]. Because a person's sleepiness cannot be measured by a physiologic or biochemical test, the physician must rely on patient self-reports. Subjective reporting of reduced sleepiness with treatment are subject to bias, in part because the patient can be assumed to desire driving privileges. The ability to monitor patients objectively varies by treatment and has not been shown to reduce risk predictably. At the present time, monitoring patients' adherence to continuous positive airway pressure (CPAP) treatment is recommended for those with obstructive sleep apnea who are commercial drivers or aircraft pilots [13, 14]. There are no guidelines for assessing the effects of other treatments for sleep apnea or treatments for other sleep disorders.

Third, most states have no laws about driving while sleepy, and where laws do exist they are inconsistent. Physicians should be aware of two relevant principles about state laws [8, 10, 11]. First, if a physician is obligated to file a report under a statute or regulation, failure to do so can establish a basis for tort liability to the patient or to a third party who is injured if the patient has a crash. Second, even if the statutory reporting obligation does not specifically cover sleep apnea or another sleep disorder, the physician may still be liable in a tort suit [10]. That is, absence of an obligation to report sleep disorders does not mitigate or preempt tort liability. State

statutes regulating noncommercial licensing vary widely in detail and scope and change over time, so physicians must be familiar with their state's current laws.

The physician is also a member of the society at large and must consider this role when weighing the limits of patient confidentiality against the safety of the community [15]. A physician may believe that there is a common-sense, citizen's duty to mitigate public risk that requires reporting and overrides the professional duty of confidentiality if a patient does not or cannot accept therapy or advice that diminishes dangerous sleepiness [8, 15].

Just how risk-averse a physician should be when determining a patient's driving impairment is a complicated subject. Assume, for example, that a doctor is extremely risk-averse and chooses to report any patient who admits symptoms of a condition like sleep apnea, regardless of the severity of the condition, driving history, or willingness to comply with behavioral management. Does this doctor expose himself or herself to liability for breaching confidentiality when the medical condition does not affect the patient's function? On the other hand, if the doctor adopts a high threshold—reporting only patients who have had mishaps on the road due to falling asleep—is he or she acting in accordance with professional obligations under the reporting statute or tort law?

Licensing Agencies

Standards for commercial driver licensing or aircraft piloting are set by federal regulatory agencies. In the case of drivers, while the crash rate is low relative to the number of miles driven, the stakes—e.g., financial loss, fatality—are greater, and scrutiny is stricter. For instance, there are specific targets for blood pressure and glucose control for those with hypertension and diabetes, respectively, and a diagnosis of narcolepsy prohibits a person from receiving a commercial license. Drivers with sleep disorders are now asked to disclose symptoms of snoring, sleepiness, and diagnoses of sleep apnea. Those self-identified as having sleep apnea must then complete additional assessments and undergo mandatory testing by a sleep specialist, with the cost for this testing usually borne by the driver. This testing may not be covered by medical insurance, inasmuch as it may not be clinically indicated. Medical malpractice claims cannot be brought against physicians who provide a consultation on the basis of an administrative referral for sleep disorders.

In the case of noncommercial licensure, the state Department of Motor Vehicles (DMV) establishes procedures and tests for permits and licenses that are often performance based. Those seeking a new or renewed license are asked about their general health and ability to operate a motor vehicle, with the assumption that the questions will be answered honestly. Each state DMV is charged with developing fair and unbiased policy and with establishing rules and restrictions for drivers with medical or physical disability.

There is often no specific language about sleep disorders in state impaired-driver restrictions, although many states ask about historical evidence for “loss of

consciousness.” This term is not defined, and it is left to the driver-applicant to interpret and disclose an accident (or near accident) that occurred when he or she fell asleep at the wheel (a “loss of consciousness”). In the states where physicians must report categories of disease that put drivers at a greater likelihood for sleepiness, e.g., sleep apnea or narcolepsy, the physician report can trigger a more intense evaluation of driving fitness. Final determinations are made by each DMV with or without the consultation of the driver’s physician.

A driver who believes he or she is wrongly restricted from driving can undergo additional testing at his or her own expense, or can challenge a determination. The role of the department in developing functional testing for a driver recovering from a sleep disorder is unclear. It is doubtful that licensing authorities have created policies and tests that effectively evaluate driving skills rather than simply relying on convenient diagnostic labels [14].

Each state and national agency has a responsibility to review its policies and procedures continually, particularly the scope of physicians’ obligation to report specific medical conditions. This review can be precipitated by public debate as happened when the death of a New Jersey citizen was attributed to a driver who admitted falling asleep after nearly 24 hours of being awake. The resulting public outcry was the impetus for Maggie’s Law, which made injury or death by a driver who has been shown to be awake for 24 hours before a crash a felony [16]. Such legislative approaches to sleepiness cast a broad net and have a potential impact on any program during which a worker or student is scheduled—or even expected—to work long hours without sleep.

Conclusion

The current inability to forecast sleepiness risk and, therefore, to legislate solutions makes this subject problematic. Predictions of risk cannot be easily made, even for those with conditions like sleep apnea or even narcolepsy, since the risk of a crash decreases once the condition is diagnosed and treated. Even in the absence of illness, sleep loss from day-to-day events such as having a sick child, being a caregiver, or having to drive at night, can produce drowsiness and inattention that reaches a level that can produce a “fall-asleep” crash. Thus, there is a case to be made for more public education on sleep and the impact of sleep loss on driving. This would move the objective from one of punitive responses to one of prevention through recognition of risk, and prevention of sleepiness while driving would become more like alcohol policy, in which both an educational and a legislative focus are important to make a significant impact on public health.

References

1. National Highway Traffic Safety Administration. *Traffic Safety Facts*. <http://www.nrd.nhtsa.dot.gov/Pubs/810791.pdf>. Accessed August 11, 2008.

2. Sassani A, Findley LJ, Kryger M, Goldlust E, George C, Davidson TM. Reducing motor-vehicle collisions, costs, and fatalities by treating obstructive sleep apnea syndrome. *Sleep*. 2004;27(3):453-458.
3. NCSDR/NHTSA Expert Panel on Driver Fatigue and Sleepiness. *Drowsy Driving and Automobile Crashes*. Washington, DC: National Highway Traffic Safety Administration; 1998.
http://www.nhtsa.dot.gov/people/injury/drowsy_driving1/Drowsy.html#NCSDR/NHTSA. Accessed August 2, 2008.
4. Oken BS, Salinsky MC. Sleeping and driving: not a safe dual-task. *Clin Neurophysiol*. 2007;118(9):1899-1900.
5. George CF. Sleep apnea, alertness, and motor vehicle crashes. *Am J Respir Crit Care Med*. 2007;176(10):954-956.
6. Desai AV, Ellis E, Wheatley JR, Grunstein RR. Fatal distraction: a case series of fatal fall-asleep road accidents and their medicolegal outcomes. *Med J Aust*. 2003;178(18):396-399.
7. Powell NB, Schechtman KB, Riley RW, Guilleminaunt C, Chiang RP, Weaver EM. Sleepy driver near-misses may predict accident risks. *Sleep*. 2007;30(3):331-342.
8. American Thoracic Society. Sleep apnea, sleepiness, and driving risk. *Am J Respir Crit Care Med*. 1994;150(5 Pt 1):1463-1473.
9. Parmet AJ. Clinical prosecution of a driver with sleep apnea. *J Occup Environ Med*. 2008;50(1):1.
10. Brown DB. Legal implications of obstructive sleep apnea. In: Kushida CA, ed. *Obstructive Sleep Apnea*. New York, NY: CRC Press; 2007:405-423.
11. Black L. Liability for failure to report child abuse. *Virtual Mentor*. 2007;9(12):819-822. <http://virtualmentor.ama-assn.org/2007/12/hlaw1-0712.html>. Accessed August 2, 2008.
12. Alonderis A, Barbe F, Bonsignore M, et al. Medico-legal implications of sleep apnea syndrome: driving license regulations in Europe. *Sleep Med*. 2008;9(4):362-75.
13. Hartenbaum N, Collop N, Rosen IM, et al. Sleep apnea and commercial motor vehicle operators: statement from the Joint Task Force of the American College of Chest Physicians, American College of Occupational and Environmental Medicine, and the National Sleep Foundation. *Chest*. 2006;130(3):902-905.
14. Miller CM, Khanna A, Strohl KP. Assessment and policy for commercial driver license referrals. *J Clin Sleep Med*. 2007;3(4):417-423.
15. Tobin BM, Leeder SR, Somerville ER. Community versus individual benefit. *Med J Aust*. 2002;176(6):279-280.
16. State of New Jersey. NJS 2C:11-5.
http://www.njleg.state.us/2002/bills/A1500/1347_R2.HTM. accessed August 11, 2008.

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MEDICINE AND SOCIETY

The Rights and Duties of the Sleeper

Robert Meadows, LLB, MA

In his classic text *Some Must Watch Whilst Some Must Sleep*, the eminent sleep scientist William C. Dement suggested that the “anthropological and sociological implications of sleep are vast and complex” [1]. He was undoubtedly correct. The way we sleep and the meanings, methods, and motives surrounding sleep are historically and culturally dependent. In medieval society, sleeping was a relatively “public” matter, whereas now the nuclear family residence remains one of the few legitimate enclaves for sleep [2]. In pre-industrial society it was common for people to have two separate intervals of sleep each night [3]; today we consider anything which deviates from a monophasic sleep pattern as a potential disorder. In some societies people “rest” in fields standing like storks, and in others husbands sleep with sons and wives sleep with daughters [4].

Once we begin to view sleep as more than “a state which has little in common with our waking life” [5], a “perceptual hole in time” [6], or “death’s counterfeit” [7], the links between sleep and society become apparent and new debates open up.

The Sleeper Role

It has been suggested that there are socially prescribed and culturally patterned roles for the sleeper, and that without these arrangements societies simply would not function [8]. Within the Western world this is said to translate into a “sleep role” or model of rights and obligations. In this sense, people have an obligation to “sleep at night and therefore to conform to the general pattern of sleep time, unless legitimate social circumstances, such as work... depict otherwise” and to “sleep in a bed, or similar device, in a private place, away from public view, in proper attire (e.g., pyjamas, nightdress)—the latter is not an absolute requirement and indeed, is increasingly being circumvented if not flouted” [9]. Rights include freedom from noise and interference from others—except in times of emergency—exemption from normal role obligations, and no loss of waking role status whilst asleep [9].

Echoes of this can be found within the English legal system. In *R v. Burgess* [10] a 32-year-old male was arrested and charged with wounding with intent, under section 18 of the Offences Against the Person Act of 1861. In his defence, Burgess claimed that he was asleep when he committed the act. The judge was charged with trying to discover whether Burgess was acting because of a “defect of reason” or, put another way, whether he was free from normal role obligations. Similarly, in *Hatton and Others v. The United Kingdom*, the European Court of Human Rights debated

whether individuals who live near an airport have a right to a good (noise-free) night's sleep [11].

Although there is much debate surrounding the details of the sleep role and whether it is unravelling in our 24/7 society [4], there are clearly normative and more informal rules of social etiquette we are expected to follow about where, when, and how we sleep [12]. Even though a snorer may well conform to the obligations and duties listed above and would not be blamed for her nocturnal noises, a bed partner may still expect her to assume responsibility and take steps (when awake) to reduce the disturbance [13].

Furthermore, researchers have shown that through normative social conventions, women have their sleep rights subjugated. Hislop and Arber found that women prioritise their partner's and children's sleep above their own. The interaction of the physical and emotional labour involved in caring for babies, young children, and teenagers and the worries and concerns associated with family responsibilities, work, and caring for ageing parents are said to compromise women's access to quality sleep [14]. From these findings they suggest that "being female within a family structure can thus be synonymous with a loss of sleeping rights" [14].

Medicalisation of Sleep

A key question presently being addressed within sociological work is whether sleep has become unnecessarily medicalised. Medicalisation involves "defining a [social] problem in medical terms, using medical language to describe the problem, adopting a medical framework to understand a problem, or using medical intervention to 'treat' it" [15]. Proponents of the medicalisation thesis often point to the development of new medical categories for conditions previously thought to be variations of normal behaviour—for example attention-deficit/hyperactivity disorder (ADHD), anorexia and eating disorders, and repetitive strain injury [16]—and examine how these variations became medical diseases.

With respect to sleep, Hislop and Arber [17] suggest that the prescribing of sleeping pills is an indicator of the medicalisation of sleep. They add, however, that for many women sleep management is not medicalised but rather takes place within the domain of "personalized strategies"; that is, women use techniques that arise from individualised and informal sources, routines and rituals such as consuming hot milky drinks and reading, to aid their sleep. Others have pointed towards the fact that public health messages and media coverage of sleep emphasise personalised strategies [18], suggesting that "personalized" may not be that far removed from "medicalized."

The debate as to whether aspects of sleep have been medicalised will continue. And it should; research on adult ADHD suggests that the diagnosis may result from a perception that it can provide a medical explanation for underperformance [16]. Recent health promotion literature on sleep states that "getting enough sleep refers to the amount of sleep you need to not feel sleepy the next day. If sleepiness interferes

with or makes it difficult to do your daily activities, you probably need more sleep” [19]. The links among diagnostic criteria for sleep disorders, function, and underperformance are, at the very least, suggestive of a medicalising move.

References

1. Dement WC. *Some Must Watch Whilst Others Sleep*. Stanford, CA: Freeman; 1972.
2. Elias N. *The Civilizing Process*. 2nd ed. Oxford, UK: Blackwell; 2000.
3. Ekirch AR. *At Day's Close: Nights in Times Past*. New York, NY: Orion Publishing; 2005.
4. Williams SJ. *Sleep and Society: Sociological Ventures into the (Un)known*. Oxfordshire, UK: Routledge; 2005.
5. Harrison Y. *Sleep Talking: Science, Needs and Misconceptions*. London, UK: Blandford; 1999.
6. Dement W C, Vaughan C. *The Promise of Sleep: The Scientific Connection Between Health, Happiness and a Good Night's Sleep*. London, UK: Macmillan; 2000.
7. Shakespeare W. *Macbeth*. Act 2, scene 3.
8. Williams SJ. Sleep and health: sociological reflections on the dormant society. *Health: Online (London)*. 2002;6:173-200.
9. Williams SJ, Bendelow G. *The Lived Body: Sociological Themes, Embodied Issues*. Abingdon, UK: Routledge; 1998:182-183.
10. *R v Burgess 2* ALL ER Rep 769(1991).
11. Hatton and Others v The United Kingdom. [GC] no. 365022/97, ECHR 2003.
12. Hislop J, Arber S. Sleepers wake! The gendered nature of sleep disruption among mid-life women. *Sociology*. 2003;37(4):709.
13. Williams SJ. The social etiquette of sleep: some sociological reflections and observations. *Sociology*. 2003;41(2):313-328.
14. Venn S. 'It's okay for a man to snore': the influence of gender on sleep disruption in couples. *Sociological Research Online*. 2007;12(5). <http://www.socresonline.org.uk/12/5/1.html>. Accessed July 28, 2008.
15. Conrad P. Medicalization and social control. *Ann Rev Sociol*. 1992;18:211.
16. Conrad P, Potter D. From hyperactive children to ADHD adults: observations on the expansion of medical categories. *Soc Probl*. 2000;47(4):559-582.
17. Hislop J, Arber S. Understanding women's sleep management: beyond medicalization-healthicization? *Sociol Health Illn*. 2004;26(4):460-463.
18. Seale C, Boden S, Williams SJ, Lowe P, Steinberg D. Media constructions of sleep and sleep disorders: a study of UK national newspapers. *Soc Sci Med*. 2007;65(3):418-430.
19. National Sleep Foundation. Let sleep work for you. http://www.sleepfoundation.org/site/c.huIXKjM0IxF/b.2419187/k.7254/Let_Sleep_Work_for_You.htm. Accessed July 24, 2008.

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MEDICINE AND SOCIETY

Modern Work and the Sleepy Worker

Steve Kroll-Smith, PhD

Let me begin with a story reported by National Public Radio on July 26, 2006:

Some employers are doing the unthinkable: encouraging workers to nap on the job. And one firm near Wall Street is trying to cash in on the concept of workday napping. It has opened a napping boutique, filled with bankers, brokers and cops who pay \$14 for a 20-minute nap [1].

Sleep and sleepiness are being tied more and more to changes in the nature of modern work, particularly to the increase in the number of hours worked and the ever-accelerating pace of work. In 1967 celebrated futurist Herman Kahn predicted that Americans would enjoy 13 weeks of vacation and a 4-day work week [2]. The challenge, it seemed, would be figuring out what to do with all our free time. Kahn, of course, was wrong. Today, Americans work more hours each year than they did in 1970, and, instead of 13 weeks of vacation, the average American now gets 4 (and that includes holidays). Perhaps more importantly, the nature of the work itself has changed. We live in a world increasingly organized around cerebral labor and the fading boundary between home and work.

The Problem of Fatigue: Muscle Labor

The academic discipline of industrial psychology was born when employers began searching for qualified employees who had internalized work discipline [3]. Early industrial psychologists like Hugo Munsterberg developed tests to assist business owners in identifying the best and most industrious employees, to find out “whether a man was moral or honest and whether he was likely to go to sleep on the job” [4]. By the turn of the 20th century, studies that timed and quantified the body’s capacity to express energy claimed to have isolated the economies of force in the human nervous system [5]. Proper sleep and naps, it is safe to say, were not among those “economies of force.”

If discussed at all, sleep was more often than not regarded as a necessary evil by many, capitalists, and judges of moral character who warned that “wasted hours are wasted money, too much sleep parboils the flesh, and sleep is a felon that steals precious time” [6]. When assessing a person’s moral suitability for work, sleep fell outside the purview of scientific management. It wasn’t sleepiness per se that vexed scientific managers, it was fatigue. Fatigue was thought of as a state of physical exhaustion. Eventually, depleted bodies unable to meet the demands of timed, muscle-driven industrialism simply quit working [4, 5]. At this point the work break

reintroduced quasi-private time into the workday, while the workplace nap lurked in the catacombs of the factory as what deCerteau [7] calls a clandestine form of rebellion against the discipline of work.

From Fatigue to Sleepiness: Advance of the Cerebral Worker

If fatigue was the primary problem of working bodies in the era of muscle labor, it is safe to say that drowsiness, defined as the absence of mental acuity, is the primary problem of working bodies in the era of flexible work and the expansion of cerebral labor [8]. Indeed, the drowsy, soporific body is frequently identified as a contributing cause of many contemporary social problems and misfortunes [9, 10]. If sleepiness was once thought of as simply a benign transition state, a prelude to sleep, it is now often described as a potential risk to self, others, and the interests of business. In testimony before a Congressional Subcommittee on Health and the Environment, a Stanford University professor makes this startling claim:

The grounding of the Exxon Valdez, the near meltdown at Three Mile Island, the Bhopal catastrophe, and the explosion of the space shuttle Challenger [were] all caused totally or in part by sleepy people [11].

The National Sleep Foundation [12] estimates that sleep deprivation costs \$175 billion a year in escalated levels of stress and ensuing loss of productivity. A Gallup poll commissioned by the National Sleep Foundation reported that 51 percent of a random sample of adults admit that sleep deprivation—which results in both fatigue and drowsiness—negatively affects their job performance [12]. Fatigue, the way we are using it, refers to the tired body; drowsiness spotlights the tired mind. The drowsy person is someone who is not thinking clearly, is prone to bad judgment, and is likely to employ faulty reasoning. This is a sobering problem in a highly automated, information-driven economy that places a premium on mental acuity. Several survey-based studies document the close correlation between sleep loss in medical residents and accidents, quarrelsome behavior, and the use of medications to increase alertness [13, 14].

Enter the Workplace Nap: Some Preliminary Data

Sleep deprivation remains a badge of honor for many hard-working entrepreneurs, professionals, and parents. The maxim, “if you snooze you lose,” is still widely applied. But there is now evidence that this heroic orientation to labor without reprieve is changing. A research institute dedicated to the identification of trends listed workplace naps as among the top 10 new habits of 1996 [15]. In a review of 23 napping studies conducted in various countries since 1970, David Dinges [16] estimated that an overall mean of 61 percent of respondents reported taking at least one nap for an average duration of 1.2 hours each week, while an overall mean of 30 percent of respondents reported napping at least four times a week. Seventy percent of 1,000 respondents to a non-systematic Internet survey conducted by Bill and Camille Anthony [17] reported that they sometimes nap at work. In a more systematic study, 16 percent of employees surveyed by the NSF reported that their

employers sanctioned napping at work, and one-third of the adults surveyed said they would nap at work if they could [18].

So it seems that a new cultural frame is emerging, one that valorizes the workplace nap. Napping at work is not likely to replace “whistling while you work” any time soon, but there is little doubt that this once forbidden behavior is on the rise [19]. For many, sleeping at work is likely to remain a subversive act performed in a niche of invisibility, but alongside this more typical, covert act, is the increasingly visible, prescribed, workplace nap. But judgments on the emergence of the nap during work hours must take into account contemporary problems of alertness, drowsiness, and performance that mark a shift in the U.S. from economies driven by brute strength and time to economies dependent upon information technology and the subtle work of cognitive and mental acuity necessary to complete complex projects.

In summary, the emergence of fatigue and drowsiness as modern medical troubles are tied inexorably to radical changes in the workplace and its effects on the rhythms and tempo of everyday life. Historian Will Durant wrote somewhere, “No one in a hurry is ever quite civilized.” A student I will call “Accelerated Amy” would likely agree. Amy writes:

If I’m reading, I think I should be writing. If I’m talking on my cell [phone] I wonder what is on my e-mail. If I’m watching *CSI*, I wonder what is happening on *American Idol*. When my boyfriend calls, I wonder if I should be talking with him or finishing a paper for tomorrow’s class. I can’t live in the present anymore. Maybe I never did... Oh, and I often wake up at 4 a.m. and can’t go back to sleep.

References

1. National Public Radio. Napping makes inroads in the workplace. *Morning Edition*. July 26, 2006. <http://www.npr.org/templates/story/story.php?storyId=5582915>. Accessed August 16, 2008.
2. Agger B. *Fast Capitalism*. Champaign, IL: University of Illinois Press; 1988.
3. Rose N. *Governing the Soul: the Shaping of the Private Self*. 2nd ed. New York, NY: Free Association Books; 1999.
4. Baritz L. *The Servants of Power: A History of the Use of Social Science in American Industry*. Middletown, CT: Wesleyan University Press; 1960:49.
5. Rabinbach A. *The Human Motor: Energy, Fatigue, and the Origins of Modernity*. Berkeley, CA: University of California Press; 1992.
6. Thompson EP. *The Making of the English Working Class*. New York, NY: Vintage Books; 1966:88.
7. de Certeau M. *The Practice of Everyday Life*. Berkeley, CA: University of California Press; 1984.

8. Kroll-Smith S. The social production of the drowsy person. *Perspectives on Social Problems*. 2000;12:89-109.
9. Moore-Ede MC. *The Twenty-Four Hour Society: Understanding Human Limits in a World that Never Sleeps*. Reading, MA: Addison-Wesley Publishing Co; 1993.
10. Rosekind MR, Graeber R, Dinges RC, et al. *Crew Factors in Flight Operations IX: Effects of Planned Cockpit Rest on Crew Performance and Alertness in Long-Haul Operations*. Moffett, CA: NASA Ames Research Center; 1994.
<http://humansystems.arc.nasa.gov/zteam/fcp/pubs/CRS.html>. Accessed August 18, 2008.
11. Kroll-Smith, 99.
12. National Commission on Sleep Disorders. *Wake Up America: A National Sleep Alert*. Bethesda, MD: US Department of Health and Human Services; 1993.
13. Baldwin DC, Daugherty SR. Sleep deprivation and fatigue in residency training: results of a national survey of first- and second-year residents. *Sleep*. 2004;27(2):217-223.
14. Samkoff J, Jacques C. A review of studies concerning effects of sleep deprivation and fatigue on residents' performance. *Acad Med*. 1991;66(11):687-693.
15. Celente G. *Trend Report 1996*. [Report available from the Trends Research Institute, P.O. Box 660, Rhinebeck, NY 12572].
16. Dinges, David F. Napping patterns and effects in human adults. In: Dinges DF, Broughton RJ, ed. *Sleep and Alertness: Chronobiological, Behavioral, and Medical Aspects of Napping*. New York, NY: Raven Publishing; 1989:171-204.
17. Anthony C, Anthony B. *The Art of Napping at Work*. Burdett, NY: Larson Publications; 1999.
18. National Sleep Foundation. *Sleep in America: 2000*. Washington, DC: National Sleep Foundation; 2000.
http://www.sleepfoundation.org/atf/cf/%7BF6BF2668-A1B4-4FE8-8D1A-A5D39340D9CB%7D/2000_poll.pdf. Accessed August 18, 2008.
19. Baxter V, Kroll-Smith S. Normalizing the workplace nap: blurring the boundaries between public and private space and time. *Current Sociology*. 2005;53(1):33-55.

Suggested Readings

Dement W, Vaughn C. *The Promise of Sleep: A Pioneer in Sleep Medicine Explores the Vital Connection Between Health, Happiness and a Good Night's Sleep*. New York: Delacorte Press; 1999.

Kroll-Smith S. Popular media and excessive daytime sleepiness; a study of rhetorical authority in medical sociology. *Sociol Health Illn*. 2003;25(6):625-643.

Nietzsche F. *The Gay Science*. Kaufmann W, trans-ed., New York, NY: Vintage Books 1974.

National Sleep Foundation. *2006 Sleep in American Poll. Summary of Findings*. Washington, DC: National Sleep Foundation; 2006.
http://www.sleepfoundation.org/atf/cf/%7BF6BF2668-A1B4-4FE8-8D1A-A5D39340D9CB%7D/2006_summary_of_findings.pdf. Accessed August 18, 2008.

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OP-ED

The Pharmacologically Enhanced Physician

William P. Cheshire Jr., MD

Would a pharmacologically enhanced physician be a better physician? The debate over “cosmetic neurology” [1, 2] has, until now, focused on the patient as consumer but not on the special case of the physician as patient.

The availability of pharmacologic therapies for the treatment of sleep, attention, memory, mood, and endurance disorders introduces the option (subject to legal and ethical constraints) of using these agents to enhance cognitive function in healthy individuals. The anticipated availability within the next few years of more potent “smart pills” aimed at the molecular base of specific brain functions, and the more distant yet conceivable prospect of direct microelectronic brain interfacing to restore lost—or enhance existing—natural functions, raise many interesting and challenging ethical questions [3]. Neuroscience is supplying incrementally an affirmative answer to the question of whether the brain of the physician can be enhanced. Whether or how that goal should be pursued, however, is a question ripe for neuroethics.

The Case for Enhancement

The practice of medicine requires the utmost professional dedication. The proficient physician must master a daunting and constantly enlarging scientific knowledge base, analyze complex sets of clinical information, navigate the intricacies of the health care system, communicate effectively and compassionately with patients, sustain attention, be responsive on a moment’s notice—day or night, and render careful judgments that have life and death implications. The most conscientious physician is, at best, subject to human limitations and cannot meet all the needs of his or her patients perfectly all the time.

There are a number of ways in which pharmacologic interventions could enhance professional performance. Wakefulness-promoting drugs might help physicians overcome disruptions in cognitive performance resulting from loss of sleep while on call. Stimulants might help them maintain mental focus during long hours of duty and frequent pager interruptions. Drugs to boost memory might help physicians retain more information from medical journals and details about the patients under their care.

Western medicine has traditionally drawn an ethical distinction between *treatment*, which aims to restore lost bodily function or preserve failing health, and *enhancement*, which aims to exceed normal capacity and has generally been understood to lie beyond the professional goals of medicine. Arguments in favor of

enhancement often point out the difficulty in defining a bright line between the two and attempt to nudge the demarcation separating enhancement from therapy [4]. The question whether to enhance the physician, however, bypasses unresolved disputes over this distinction, insofar as the pursuit of certain enhancements could *indirectly* fulfill the traditional goals of medicine.

Whereas some patients in primarily nonservice careers might request enhancing drugs for the purpose of gaining a personal competitive edge, physicians might consider their taking cognitive-enhancing medication altruistic rather than selfish. The physician who seeks pharmacologic enhancement for the purpose of serving his or her patients better strives to uphold the moral virtues of dutifulness, industriousness, and generosity and adheres to the utilitarian principle of providing the greatest good for the greatest number. The use of enhancing drugs to improve the professional's performance for the sake of the common good would seem more compelling than arguing for their use for the sake of gratifying an aspiration to personal achievement.

Whether pharmacologically augmented physician performance would deliver better patient care is, for the moment, a hypothetical question. As such, it is also a potentially testable question. Preliminary data is emerging in nonmedical categories of performance. Methylphenidate has been shown to decrease errors from inattentive driving in adolescents with attention-deficit hyperactivity disorder [5]. Whether methylphenidate or other stimulants could decrease performance errors by those without the disorder or by physicians is an untested question. In another study, donepezil was shown to improve retention of training on complex aviation tasks among licensed pilots without dementia [6].

Suppose that future well-designed controlled studies were to provide evidence that physician use of enhancing drugs could, for example, decrease the incidence of medical error. Convincing evidence supports a strong link between physician sleepiness and medical error, particularly among interns and residents [7, 8]. The sleep-deprived physician who desires to be available to meet the needs of patients might come to view the use of wakefulness-promoting or vigilance-enhancing drugs as an alternative to work-hour restrictions [9] and a responsible choice in the best interest of his or her patients.

The Case against Enhancement

Physicians recognize that no drug is without potential adverse side effects. Likewise, technological gains invariably entail potential harms. Decisions regarding interventions that modify brain function require an especially high standard of precaution because they penetrate to the core of human nature.

Safety is the first level of ethical scrutiny. Prior to their routine use in healthy individuals, cognitive performance-enhancing drugs must be shown to be at least reasonably safe in the short and long term. Among professionals, physicians, in particular, are accustomed to sacrificing their own interests for the sake of their

patients and might willingly forgo a personal health safety measure. While intermittent sacrifices are laudable, persistent, amplified expense of mental effort without adequate rest might eventually compromise the physician's capacity to serve.

There is also the possibility that the physician's choice to use or refrain from taking cognitive function-enhancing drugs might not be entirely uncoerced. Suspending for the moment any current (and potentially revisable) legal restrictions, if their use were to become accepted, peer pressure might encourage more routine use, particularly if, in the end, reduced risk of harm to patients from medical error could be shown. Extending the expectation to take cognitive-enhancing drugs to physicians-in-training could become a more overt form of coercion.

It seems highly unlikely that professional societies, hospitals, and clinics (particularly the nonmilitary) would mandate that physicians take drugs to reduce medical error, were their use permissible. Some physicians might, nonetheless, choose to do so to compete more successfully in the health care market or to enhance academic productivity. These motivations could potentially drive the demand for brain-boosting drugs more powerfully than the altruistic intentions behind the initial decision to use them. Doing what it takes to keep up with supercharged peers might, in time, reshape the moral landscape of medicine. Physicians by nature are hard-working and frequently perfectionists. Sustained reliance on cognitive stimulants could accelerate the risk of physician burnout.

Pharmacologic enhancements are routinely banned in competitive sports because they confer an unfair advantage. In medicine, it is not the goals of competitive sport that would be jeopardized, but virtue. Confidence in performance-enhancing drugs introduces a subtle shift in emphasis from virtue to performance. One wonders whether the medicated physician who enhances productivity by taking a pill would be as virtuous as the physician who achieves the same level of productivity through effort, willpower, and perseverance. Blurring the distinction between professionalism and pharmacologic efficacy would undermine the former while placing undue emphasis on the latter as a solution to life's problems. If the physician's cognitive resources truly derive from the pharmacy, then the patient, as a consumer, may have the right to request better service from a more efficient, apparently *enhanced* health care provider.

Physicians who routinely took drugs to enhance their cognitive function could not justifiably withhold such drugs from their healthy patients who desired a similar professional edge or enhancement of job safety. If the focus of medical practice were to be diverted to supplying healthy individuals with cognitive performance-enhancing drugs to satisfy a potentially limitless appetite for personal perfection, then the practice of cosmetic medicine could become indistinguishable from standard medical care. In such a system, patients with medical disorders would compete with healthy patients for access to medical care, which is a limited resource. The care of the sick would be unacceptably compromised.

Conclusion

Limited forms of pharmacologic cognitive enhancement may be beneficial to the practice of medicine. Caffeine, for example, used in moderation can help to alleviate fatigue and drowsiness following night call. As a health care professional, the physician has the right to go without sleep if he or she believes that it is in the best interest of the patient. The healthy physician similarly has the right to be unmedicated. Routine pharmacologic stimulation of health care professionals will not necessarily lead to better medicine. Cognitive enhancement pushed to the extreme is likely to be counterproductive. Undue emphasis on the instrumental aspect of medicine would potentially neglect other important aspects of medical professionalism such as striving for humility, compassion, altruism, interpersonal communication, and human wisdom that are always needed at the patient's bedside.

References

1. Chatterjee A. Cosmetic neurology: the controversy over enhancing movement, mentation, and mood. *Neurology*. 2004;63(6):968-974.
2. Chatterjee A. The promise and predicament of cosmetic neurology. *J Med Ethics*. 2006;32(2):110-113.
3. Cheshire WP. Drugs for enhancing cognition and their ethical implications: a hot new cup of tea. *Expert Rev Neurother*. 2006;6(3):263-266.
4. The President's Council on Bioethics. *Beyond Therapy: Biotechnology and the Pursuit of Happiness*. Washington, DC: US Government Printing Office; 2003:13-16.
http://www.bioethics.gov/reports/beyondtherapy/beyond_therapy_final_webcorrected.pdf. Accessed July 29, 2008.
5. Cox DJ, Humphrey JW, Merkel RL, Penberthy JK, Kovatchev B. Controlled-release methylphenidate improves attention during on-road driving by adolescents with attention-deficit/hyperactivity disorder. *J Am Board Fam Pract*. 2004;17(4):235-239.
6. Yesavage JA, Mumenthaler MS, Taylor JL, et al. Donepezil and flight simulator performance: effects on retention of complex skills. *Neurology*. 2002;59(1):123-125.
7. Landrigan CP, Rothschild JM, Cronin JW, et al. Effect of reducing interns' work hours on serious medical errors in intensive care units. *N Engl J Med*. 2004;351(18):1838-1848.
8. Lockley SW, Barger LK, Ayas NT, Rothschild JM, Czeisler CA, Landrigan CP; Harvard Work Hours, Health and Safety Group. Effects of health care provider work hours and sleep deprivation on safety and performance. *Jt Comm J Qual Patient Saf*. 2007;33(11 Suppl):7-18.
9. Nelson D. Prevention and treatment of sleep deprivation among emergency physicians. *Pediatr Emerg Care*. 2007;23(7):498-503.

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SUGGESTED READINGS AND RESOURCES

Agger B. *Fast Capitalism*. Champaign, IL: University of Illinois Press; 1988.
Aldrich MS. Automobile accidents in patients with sleep disorders. *Sleep*. 1989;12(6):487-494.

Alonderis A, Barbe F, Bonsignore M, et al. Medico-legal implications of sleep apnea syndrome: driving license regulations in Europe. *Sleep Med*. 2008;9(4):362-75.

American Medical Association. Opinion 8.06 Prescribing and dispensing drugs and devices. *Code of Medical Ethics*. Chicago, IL: American Medical Association; 2008. http://www.ama-assn.org/apps/pf_new/pf_online?f_n=browse&doc=policyfiles/HnE/E-8.06.HTM&&s_t=&st_p=&nth=1&prev_pol=policyfiles/HnE/E-7.05.HTM&nxt_pol=policyfiles/HnE/E-8.01.HTM&. Accessed July 15, 2008.

American Medical Association. Opinion 8.115 Termination of the physician-patient relationship. *Code of Medical Ethics*. Chicago, IL: American Medical Association; 2008. http://www.ama-assn.org/apps/pf_new/pf_online?f_n=browse&doc=policyfiles/HnE/E-8.115.HTM&&s_t=&st_p=&nth=1&prev_pol=policyfiles/HnE/E-7.05.HTM&nxt_pol=policyfiles/HnE/E-8.01.HTM&. Accessed July 24, 2008.

American Medical Association. Opinion 9.07 Medical testimony. *Code of Medical Ethics*. Chicago, IL: American Medical Association; 2008. http://www.ama-assn.org/apps/pf_new/pf_online?f_n=browse&doc=policyfiles/HnE/E-9.07.HTM&&s_t=&st_p=&nth=1&prev_pol=policyfiles/HnE/E-8.21.HTM&nxt_pol=policyfiles/HnE/E-9.01.HTM&. Accessed July 28, 2008.

American Medical Association. Opinion 10.015 The patient-physician relationship. *Code of Medical Ethics*. Chicago, IL: American Medical Association; 2008. http://www.ama-assn.org/apps/pf_new/pf_online?f_n=browse&doc=policyfiles/HnE/E-10.015.HTM&&s_t=&st_p=&nth=1&prev_pol=policyfiles/HnE/E-9.132.HTM&nxt_pol=policyfiles/HnE/E-10.01.HTM&. Accessed July 24, 2008.

American Medical Association. Principles of medical ethics. *Code of Medical Ethics*. Chicago, IL: American Medical Association; 2008. <http://www.ama-assn.org/ama/pub/category/2512.html>. Accessed July 30, 2008.

American Thoracic Society. Sleep apnea, sleepiness, and driving risk. *Am J Respir Crit Care Med.* 1994;150(5 Pt 1):1463-1473.

Anthony C, Anthony B. *The Art of Napping at Work.* Burdett, NY: Larson Publications; 1999.

Associated Press. USOC IDs failed drug test athletes. <http://www.cbsnews.com/stories/2003/12/30/national/main590778.shtml>. Accessed July 15, 2008.

Baldwin DC, Daughtery SR. Sleep deprivation and fatigue in residency training: results of a national survey of first- and second-year residents. *Sleep.* 2004;27(2):217-223.

Baritz L. *The Servants of Power: A History of the Use of Social Science in American Industry.* Middletown, CT: Wesleyan University Press; 1960:49.

Baxter V, Kroll-Smith S. Normalizing the workplace nap: blurring the boundaries between public and private space and time. *Current Sociology.* 2005;53(1):33-55.

Bedard MA, Montplaisir J, Malo J, Richer F, Rouleau I. Persistent neuropsychological deficits and vigilance impairment in sleep apnea syndrome after treatment with continuous positive airways pressure (CPAP). *J Clin Exp Neuropsychol.* 1993;15(2):330-341.

Bernat JL. Medical futility: definition, determination and disputes in critical care. *Neurocrit Care.* 2005; 2(2):198-205.

Black L. Liability for failure to report child abuse. *Virtual Mentor.* 2007;9(12):819-822. <http://virtualmentor.ama-assn.org/2007/12/hlaw1-0712.html>. Accessed August 2, 2008.

Boeve BF, Silber MH, Saper CB, et al. Pathophysiology of REM sleep behaviour disorder and relevance to neurodegenerative disease. *Brain.* 2007;130(Pt 11):2770-2788.

Brown DB. Legal implications of obstructive sleep apnea. In: Kushida CA, ed. *Obstructive Sleep Apnea.* New York, NY: CRC Press; 2007:405-423.

Burns JP, Truog RD. Futility: a concept in evolution. *Chest.* 2007;132(6):1987-1993.

California Business and Professions Code Section 725-733. Unprofessional conduct. <http://law.justia.com/california/codes/bpc/725-733.html>.

Capozzi JD, Rhodes R, Gantsoudes G. Ethics in practice. Terminating the physician-patient relationship. *J Bone Joint Surg Am.* 2008; 90(1):208-210.

Celente G. *Trend Report 1996*. [Report available from the Trends Research Institute, P.O. Box 660, Rhinebeck, NY 12572].

Chatterjee A. Cosmetic neurology: the controversy over enhancing movement, mentation, and mood. *Neurology*. 2004;63(6):968-974.

Chatterjee A. The promise and predicament of cosmetic neurology. *J Med Ethics*. 2006;32(2):110-113.

Cheshire WP. Drugs for enhancing cognition and their ethical implications: a hot new cup of tea. *Expert Rev Neurother*. 2006;6(3):263-266.

Cox DJ, Humphrey JW, Merkel RL, Penberthy JK, Kovatchev B. Controlled-release methylphenidate improves attention during on-road driving by adolescents with attention-deficit/hyperactivity disorder. *J Am Board Fam Pract*. 2004;17(4):235-239.

Cramer Bornemann MA, Mahowald MW, Schenck CH. Forensic sleep medicine issues: violent parasomnias. In: Smith HR, Comella CL, Hogl B, eds. *Sleep Medicine*. New York, NY: Cambridge University Press; 2008:240-255.

Cramer Bornemann MA, Mahowald MW, Schenck CH. Parasomnias: clinical features and forensic implications. *Chest*. 2006;130(2):605-610.

de Certeau M. *The Practice of Everyday Life*. Berkeley, CA: University of California Press; 1984.

Dement W, Vaughn C. *The Promise of Sleep: A Pioneer in Sleep Medicine Explores the Vital Connection Between Health, Happiness and a Good Night's Sleep*. New York: Delacorte Press; 1999.

Denno DW. Crime and consciousness: science and involuntary acts. *Minn Law Rev*. 2002;87(2):269-400.

Desai AV, Ellis E, Wheatley JR, Grunstein RR. Fatal distraction: a case series of fatal fall-asleep road accidents and their medicolegal outcomes. *Med J Aust*. 2003;178(18):396-399.

Dinges, David F. Napping patterns and effects in human adults. In: Dinges DF, Broughton RJ, ed. *Sleep and Alertness: Chronobiological, Behavioral, and Medical Aspects of Napping*. New York, NY: Raven Publishing; 1989:171-204.

Findley LJ, Unverzagt ME, Suratt PM. Automobile accidents in patients with obstructive sleep apnea. *Am Rev Respir Dis*. 1988;138(12):337-340.

- Gagnon MA, Lexchin J. The cost of pushing pills: a new estimate of pharmaceutical promotion expenditures in the United States. *PLOS Medicine*. 2008;5:e1.
- Gamaldo CE, Salas RE. Sleep medicine education: are medical schools and residency programs napping on the job? *Nat Clin Pract Neurol*. 2008;4(6):344-345.
- George CF. Sleep apnea, alertness, and motor vehicle crashes. *Am J Respir Crit Care Med*. 2007;176(10):954-956.
- Goldberg PE. The physician-patient relationship: three psychodynamic concepts that can be applied to primary care. *Arch Fam Med*. 2000;9(10):1164-1168.
- Goodwin DW, Othmer E, Halikas JA, Freemon F. Loss of short-term memory as a predictor of the alcoholic blackout. *Nature*. 1970;227(5254):201-202.
- Guilleminault C, Connolly SJ, Winkle RA. Cardiac arrhythmias and conduction disturbances during sleep in 400 patients with sleep apnea syndrome. *Am J Cardiol*. 1983;52(5):490-494.
- Hammonds v Aetna Casualty and Surety Co*, 237 F Supp 96,98 (ND Ohio, 1965).
- Harding SM, Berner ES. Developing an action plan for integrating sleep topics into the medical school curriculum. *Sleep Breath*. 2002;6(4):155-160.
- Hartenbaum N, Collop N, Rosen IM, et al. Sleep apnea and commercial motor vehicle operators: statement from the Joint Task Force of the American College of Chest Physicians, American College of Occupational and Environmental Medicine, and the National Sleep Foundation. *Chest*. 2006;130(3):902-905.
- Hublin C, Kaprio J, Partinen M, Heikkila K, Koskenvuo M. Prevalence and genetics of sleepwalking: a population-based twin study. *Neurology* 1997;48(1):177-181.
- Hung J, Whitford EG, Parsons RW, Hillman DR. Association of sleep apnea with myocardial infarction in men. *Lancet*. 1990;336(8710):261-264.
- Jamieson A, Guilleminault C, Partinen M, Quera-Salva MA. Obstructive sleep apnea patients have craniomandibular abnormalities. *Sleep*. 1986;9(4):469-477.
- Kales A, Cadieux RJ, Bixler EO, et al. Severe obstructive sleep apnea—I: Onset, clinical course, and characteristics. *J Chron Dis*. 1985;38(5):419-425.
- Kapur V, Krohl KP, Redline S, Iber C, O'Connor G, Nieto J. Underdiagnosis of sleep apnea syndrome in U.S. communities. *Sleep Breath*. 2002;6(2):49-54.
- Kiser v Rubin*, No. 15254, 1995 Ohio App. LEXIS 3928 at slip op 1 (2d App Dist September 8, 1995) (unpublished).

Kroll-Smith S. Popular media and ‘excessive daytime sleepiness’: a study of rhetorical authority in medical sociology. *Sociology of Health and Illness*. 2003;25(6):626-627.

Kroll-Smith S. Popular media and excessive daytime sleepiness; a study of rhetorical authority in medical sociology. *Sociol Health Illn*. 2003;25(6):625-643.

Kroll-Smith S. The social production of the drowsy person. *Perspectives on Social Problems*. 2000;12:89-109.

Kruszewski SP. Euphorogenic and abusive properties of modafinil. *Am J Psychiatry*. 2006;163(3):549.

Kushida CA, Efron B, Guilleminault C. A predictive morphometric model for the obstructive sleep apnea syndrome. *Ann Intern Med*. 1997;127(8 Pt 1):581-587.

Landrigan CP, Rothschild JM, Cronin JW, et al. Effect of reducing interns’ work hours on serious medical errors in intensive care units. *N Engl J Med*. 2004;351(18):1838-1848.

Lockley SW, Barger LK, Ayas NT, Rothschild JM, Czeisler CA, Landrigan CP; Harvard Work Hours, Health and Safety Group. Effects of health care provider work hours and sleep deprivation on safety and performance. *Jt Comm J Qual Patient Saf*. 2007;33(11 Suppl):7-18.

Mahowald MW, Schenck CH, Cramer Bornemann MA. Finally—sleep science for the courtroom. *Sleep Med Rev*. 2007;11(1):1-3.

Mahowald MW, Schenck CH. Violent parasomnias: forensic medicine issues. In: Kryger MH, Roth T, Dement WC, eds. *Principles and Practice of Sleep Medicine*. Philadelphia, PA: Elsevier Saunders; 2005: 960-968.

Miller CM, Khanna A, Strohl KP. Assessment and policy for commercial driver license referrals. *J Clin Sleep Med*. 2007;3(4):417-423.

Moore-Ede MC. *The Twenty-Four Hour Society: Understanding Human Limits in a World that Never Sleeps*. Reading, MA: Addison-Wesley Publishing Co; 1993.

Naegele B, Thouvard V, Pepin JL, et al. Deficits of cognitive executive functions in patients with sleep apnea syndrome. *Sleep*. 1995;18(1):43-52.

National Commission on Sleep Disorders. *Wake Up America: A National Sleep Alert*. Bethesda, MD: US Department of Health and Human Services; 1993.

National Highway Traffic Safety Administration. *Traffic Safety Facts*. <http://www.nrd.nhtsa.dot.gov/Pubs/810791.pdf>. Accessed August 11, 2008.

National Public Radio. Napping makes inroads in the workplace. *Morning Edition*. July 26, 2006. www.npr.org/templates/story/story.php?storyId=5582915. Accessed August 16, 2008.

National Sleep Disorders Research Plan. *Sleep*. 2003;26(3):253-257.

National Sleep Foundation. *2000 Sleep in America*. Washington, DC: National Sleep Foundation; 2000. http://www.sleepfoundation.org/atf/cf/%7BF6BF2668-A1B4-4FE8-8D1A-A5D39340D9CB%7D/2000_poll.pdf. Accessed August 18, 2008.

National Sleep Foundation. *2005 Sleep in America Poll Summary of Findings*. Washington, DC: National Sleep Foundation; 2005. http://www.kintera.org/atf/cf/%7BF6BF2668-A1B4-4FE8-8D1A-A5D39340D9CB%7D/2005_summary_of_findings.pdf. Accessed July 30, 2008.

National Sleep Foundation. *2006 Sleep in American Poll. Summary of Findings*. Washington, DC: National Sleep Foundation; 2006. http://www.sleepfoundation.org/atf/cf/%7BF6BF2668-A1B4-4FE8-8D1A-A5D39340D9CB%7D/2006_summary_of_findings.pdf. Accessed August 18, 2008.

National Sleep Foundation. *2008 Sleep in America Poll Summary of Findings*. Washington, DC: National Sleep Foundation; 2008. <http://www.sleepfoundation.org/atf/cf/%7Bf6bf2668-a1b4-4fe8-8d1a-a5d39340d9cb%7D/2008%20POLL%20SOF.PDF>. Accessed July 21, 2008.

NCSDR/NHTSA Expert Panel on Driver Fatigue and Sleepiness. *Drowsy Driving and Automobile Crashes*. Washington, DC: National Highway Traffic Safety Administration; 1998. http://www.nhtsa.dot.gov/people/injury/drowsy_driving1/Drowsy.html#NCSDR/NHTSA. Accessed August 2, 2008.

Nelson D. Prevention and treatment of sleep deprivation among emergency physicians. *Pediatr Emerg Care*. 2007;23(7):498-503.

Nietzsche F. *The Gay Science*. Kaufmann W, trans-ed., New York, NY: Vintage Books 1974.

Ohio Administrative Code. Chapter 4731-27-01 Termination of the physician-patient relationship. <http://codes.ohio.gov/oac/4731-27>. Accessed July 24, 2008.

Oken BS, Salinsky MC. Sleeping and driving: not a safe dual-task. *Clin Neurophysiol*. 2007;118(9):1899-1900.

- Papp KK, Miller CM, Strohl KP. Graduate medical training, learning, relationships, and sleep loss. *Sleep Med Rev.* 2006;10(5):339-345.
- Parment AJ. Clinical prosecution of a driver with sleep apnea. *J Occup Environ Med.* 2008;50(1):1.
- Partinen M, Guilleminault C. Daytime sleepiness and vascular morbidity at seven-year follow-up in obstructive sleep apnea patients. *Chest.* 1990;97(1):27-32.
- Powell NB, Schechtman KB, Riley RW, Guilleminault C, Chiang RP, Weaver EM. Sleepy driver near-misses may predict accident risks. *Sleep.* 2007;30(3):331-342.
- Prendergast TJ. Futility and the common cold. How requests for antibiotics can illuminate care at the end of life. *Chest.* 1995;107(3):836-844.
- Pressman MR, Mahowald MW, Schenck CH, Cramer Bornemann M. Alcohol-induced sleepwalking or confusional arousal as a defense to criminal behavior: a review of scientific evidence, methods and forensic considerations. *J Sleep Res.* 2007;16(2):198-212.
- Provigil [package insert]. Frazer, PA: Cephalon, Inc.; 2008.
http://www.provigil.com/Media/PDFs/prescribing_info.pdf. Accessed July 15, 2008.
- Rabinbach A. *The Human Motor: Energy, Fatigue, and the Origins of Modernity.* Berkeley, CA: University of California Press; 1992.
- Rose N. *Governing the Soul: the Shaping of the Private Self.* 2nd ed. New York, NY: Free Association Books; 1999.
- Rosekind MR, Graeber R, Dinges RC, et al. *Crew Factors in Flight Operations IX: Effects of Planned Cockpit Rest on Crew Performance and Alertness in Long-Haul Operations.* Moffett, CA: NASA Ames Research Center; 1994.
<http://humansystems.arc.nasa.gov/zteam/fcp/pubs/CRS.html>. Accessed August 18, 2008.
- Rosen R, Mahowald M, Chesson A, et al. The Taskforce 2000 survey on medical education in sleep and sleep disorders. *Sleep.* 1998;21(3):235-254.
- Rosen RC, Rosenkind M, Rosevar C, Cole WE, Dement WC. Physician education in sleep and sleep disorders: a national survey of U.S. medical schools. *Sleep.* 1993;16(3):249-254.
- Rosen RC, Zozula R, Jahn EG, Carson JL. Low rates of recognition of sleep disorders in primary care: comparison of a community-based versus clinical academic setting. *Sleep Med.* 2001;2(1):47-55.

Samkoff J, Jacques C. A review of studies concerning effects of sleep deprivation and fatigue on residents' performance. *Acad Med*. 1991;66(11):687-693.

Sassani A, Findley LJ, Kryger M, Goldlust E, George C, Davidson TM. Reducing motor-vehicle collisions, costs, and fatalities by treating obstructive sleep apnea syndrome. *Sleep*. 2004;27(3):453-458.

Schenck C. What do parasomnias tell us about the brain? Presented at: Sleep Research Society Trainee Symposia; June 8, 2008; Baltimore MD.

Schenck CH, Arnulf I, Mahowald MW. Sleep and sex: what can go wrong? A review of the literature on sleep related disorders and abnormal sexual behaviors and experiences. *Sleep*. 2007;30(6):683-702.

Schopp RF. *Automatism, Insanity, and the Psychology of Criminal Responsibility: A Philosophical Inquiry*. New York, NY: Cambridge University Press; 1991.

Seale C, Boden S, Williams S, Lowe P, Steinberg D. Media constructions of sleep and sleep disorders: a study of UK national newspapers. *Social Science and Medicine*. 2007;65(3):418-430.

State of New Jersey. NJS 2C:11-5.

http://www.njleg.state.us/2002/bills/A1500/1347_R2.HTM. Accessed August 11, 2008.

Tassanari CA, Rubboli G, Gardella E, et al. Central pattern generators for a common semiology in fronto-limbic seizures and in parasomnia. A neuroethologic approach. *Neurol Sci*. 2005;26(suppl 3):s225-s232.

Teodorescu MC, Avidan AY, Teodorescu M, et al. Sleep medicine content of major medical textbooks continues to be underrepresented. *Sleep Med*. 2007;8(3):271-276.

The President's Council on Bioethics. *Beyond Therapy: Biotechnology and the Pursuit of Happiness*. Washington, DC: US Government Printing Office; 2003:13-16.

http://www.bioethics.gov/reports/beyondtherapy/beyond_therapy_final_webcorrected.pdf. Accessed July 29, 2008.

Thompson EP. *The Making of the English Working Class*. New York, NY: Vintage Books; 1966:88.

Tobin BM, Leeder SR, Somerville ER. Community versus individual benefit. *Med J Aust*. 2002;176(6):279-280.

US Department of Justice. *Lists of: Scheduling Actions, Controlled Substances, Regulated Chemicals*. Washington, DC: Drug Enforcement Agency; 2008.

<http://www.deadiversion.usdoj.gov/schedules/orangebook2008.pdf>. Accessed July 15, 2008.

Wechsler H, Lee JE, Kuo M., Seibring M, Nelson TF, Lee H. Trends in college binge drinking during a period of increased prevention efforts. Findings from 4 Harvard School of Public Health College Alcohol Study surveys: 1993-2001. *J Am Coll Health*. 2002;50(5):203-217.

Wei K, Bradley TD. Association of obstructive sleep apnea and nocturnal angina [abstract]. *Am Rev Respir Dis*. 1992;145(4 pt 2):A433.

Weissenborn R, Duka T. Acute alcohol effects on cognitive function in social drinkers: their relationship to drinking habits. *Psychopharmacology (Berl)*. 2003;165(3):306-312.

White AM, Jamieson-Drake DW, Swartzwelder HS. Prevalence and correlates of alcohol-induced blackouts among college students: results of an e-mail survey. *J Am Coll Health*. 2002;51(3):117-131.

White AM, Matthews DB, Best PJ. Ethanol, memory and hippocampal function: a review of recent findings. *Hippocampus*. 2000;10(1):88-93.

World Anti-Doping Agency. World anti-doping code. The 2008 prohibited list. International standard. http://www.wada-ama.org/rtecontent/document/2008_List_En.pdf. Accessed July 15, 2008.

Yesavage JA, Mumenthaler MS, Taylor JL, et al. Donepezil and flight simulator performance: effects on retention of complex skills. *Neurology*. 2002;59(1):123-125.

Zinn WM. Transference phenomena in medical practice: being whom the patient needs. *Ann Intern Med*. 1990;113(4): 293-298.

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Theme Issue Editor

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