Commentary

Drowsiness and Driving—A Dangerous Duo

Physicians have a responsibility to recognize that sleep-deprived drivers are a danger to themselves and others and to treat the disorders that cause drowsiness.

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In April 2006, the Institute of Medicine released its long-awaited report on sleep disorders and sleep deprivation.[1] This report documents the extraordinary prevalence of sleepiness and sleep disorders in our society and emphasizes the serious physiologic and performance consequences associated with these conditions. Of particular clinical and legal importance to practicing physicians is the issue of sleepiness and its effect on performance as it pertains to themselves, their trainees, their patients, and hospital and clinic employees.

Sleepiness and Driving

Despite the fact that excessive daytime sleepiness (EDS) is very common, the magnitude of the problem is clearly under-appreciated by the general public, health care professionals, and policymakers. EDS must be taken seriously, as it can cause motor vehicle and industrial accidents, and impair work/school performance and psychosocial functioning. It is likely that more than 20% of motor vehicle crashes can be attributed to sleepiness.[2] In one large population survey, people reporting EDS were found to be at double the risk of being involved in motor vehicle crashes compared with those who do not report EDS.[3] To put it in perspective, being awake 20 to 25 hours affects performance in the same way as having a blood-alcohol concentration of 0.10%, a level deemed unsafe and unacceptable when working or driving.[4] In a British study, 29% of drivers said they had felt close to falling asleep at the wheel within the preceding year, and 9% to 10% of all motor vehicle crashes were associated with tiredness.[5]

Motor vehicle crashes that are the result of the driver falling asleep are undoubtedly grossly under-reported for a number of reasons, the primary one being that sleepiness at the time of the crash cannot be measured or verified after the fact; and in fatal motor vehicle crashes, sleepiness (unlike alcohol) does not show up at autopsy. Often, drivers who have fallen asleep are unaware of the fact that sleepiness played a role in the crash.

Certain groups are at particularly high risk for driving while sleepy: volitionally sleep-deprived individuals, adolescents, shift workers, people with underlying undiagnosed and untreated sleep disorders, and commercial truck drivers.

Common Causes

By far, the most common cause of EDS in our society is volitional or deliberate sleep deprivation. (Anyone who uses an alarm clock to wake up is, by definition, sleep deprived—and any degree of sleep deprivation will impair performance to some extent.) The two most common sleep disorders— narcolepsy and obstructive sleep apnea—are also a cause of EDS. To effectively treat EDS, it is essential to establish the correct etiology. It should be noted that depression does not cause true EDS.

♦ Volitional Sleep Deprivation

Many people are raised to believe that sleep deprivation should be worn as a badge of honor, reflecting the pervasive societal attitude that sleepiness is a minor annoyance that can be overcome by motivation, commitment, dedication, or sheer will. This is simply not true. The consequences of sleep deprivation are relentlessly cumulative, and the effect on performance and mood escalate over time. One does not get used to sleepiness: Accumulated sleep debt is dissipated only by catching up on sleep. Chronic volitional sleep deprivation (including sleep deprivation associated with shift work) as a cause of EDS can usually be determined by taking a patient's history.

♦ Obstructive Sleep Apnea

Obstructive sleep apnea is a form of sleep-disordered breathing that causes sleep fragmentation, poor sleep quality, and severe EDS. Patients with obstructive sleep apnea have a 7-fold higher rate of reported motor vehicle crashes than those who do not have the condition.[6] In addition to increasing the short-term risk of sleep-related motor vehicle crashes, obstructive sleep apnea is also a longer-term risk factor for the development of hypertension, diabetes, obesity, depression, heart attack, and stroke.[1]

Formal polysomnography is recommended, if not required, to establish the diagnosis of obstructive sleep apnea in most cases. The proper level of nasal continuous airway pressure (nasal CPAP) for treatment of obstructive sleep apnea may also be established during the study. Treatment with CPAP has been shown to reduce motor vehicle crashes in such patients.[7] Short of permanent tracheostomy, other upper airway surgical procedures are not predictably effective.

♦ Narcolepsy
Narcolepsy affects 1 in every 2,000 people. Patients with narcolepsy experience unwanted or unanticipated episodes of sleep that are usually associated with reduced environmental stimulation (eg, reading, watching television, and driving a car). Ancillary symptoms include cataplexy (sudden loss of muscle tone triggered by emotionally laden events), hypnagogic hallucinations (hallucinations occurring just as sleep is beginning), and sleep paralysis. (Hypnagogic hallucinations and sleep paralysis may occur in normal individuals, particularly if they are sleep-deprived or have a sleep disorder such as obstructive sleep apnea.)

If narcolepsy is suspected, polysomnography is required to determine the quality and quantity of the preceding night's sleep. This rules out other causes of EDS such as sleep apnea. Poor sleep on the preceding night may give a false-positive result on the multiple sleep latency test (MSLT), which is an objective measure of the tendency to fall asleep during the day. The individual is given a series of five 20-minute nap opportunities at 2-hour intervals. Normal well-rested adults fall asleep in an average of 15 minutes. On the MSLT, patients with narcolepsy typically fall asleep within 5 minutes or less and usually display REM sleep during at least 2 daytime naps. (People who do not have narcolepsy would have to have stayed awake all night to obtain a similar score on the MSLT.) MSLT results must be interpreted in light of the entire clinical picture, as false-negatives can and do occur.

The treatment of narcolepsy includes the use of stimulant medications (methylphenidate, methamphetamine, dextroamphetamine, or modafinil) for hypersomnia, and tricyclic antidepressants, serotonin-specific reuptake inhibitors, or gamma hydroxybutyrate for cataplexy.

What to Do
The dangers of sleeplessness and driving are beginning to be recognized in the legal community. The number of successful prosecutions and civil suits against drowsy drivers is increasing. And, in some cases, drivers who fall asleep and are involved in crashes that result in injury or death are being treated as felons—not unlike drunk drivers. For example, in 1993, New Jersey enacted "Maggie's Law," which stated that a sleep-deprived driver is a reckless driver who can be convicted of vehicular homicide. The medical community also must appreciate the dangers of driving while sleepy and do something to stop the practice. Patients need to know that scientific study has shown that the commonly used "tricks" for staying awake while driving, such as rolling down the windows or turning up the air conditioner or radio, are ineffective for increasing alertness and that the only truly effective countermeasures are ingesting caffeine or taking a nap.[8,9]

And physicians themselves need to change their attitudes about EDS. Contrary to wishful thinking, sleep-deprived physicians are just as impaired as anyone else who is sleep-deprived. Physicians often consider sleep deprivation a testimony to their hard work, dedication, and commitment. We have the delusion that we can overcome sleepiness more effectively than others. In fact, no amount of motivation or dedication can overcome the consequences of sleep deprivation.

To address the concern of sleep deprivation on performance, the Accreditation Council of Graduate Medical Education has limited the hours of duty for house officers. Post-call performance has been shown to be comparable to the impairment associated with a blood-alcohol concentration of 0.04% to 0.05%.[10] Although the data on impaired clinical performance because of sleepiness are conflicting, it is clear that sleepiness impairs mood and that car crashes caused by house officers falling asleep correlate with hours of duty.[11]

Increasingly, hospitals and clinics that require shift work are finding themselves liable for errors and car crashes related to sleepiness following an employee's extended hours of duty.[12] This may result in serious legal and financial consequences. Therefore, hours of duty in any workplace should reflect the known consequences of sleep deprivation.

Patients who complain of EDS should be clearly informed as to the dangers of drowsy driving, with documentation in their medical record. Those who have been involved in a crash caused by their falling asleep should be discouraged from driving until the underlying condition is identified and treated. Some states require that patients with suspected sleep disorders resulting in EDS be reported to the licensing bureau. Such policies are not based on scientific data and should be implemented with great caution for two reasons: 1) the overwhelming majority of sleepy drivers have volitional sleep deprivation, and 2) such a policy would discourage patients with sleep disorders from seeking medical attention.

Changing Attitudes toward Sleepiness and Driving
There is incontrovertible evidence that sleepiness while driving takes a severe toll on individuals and society. Unfortunately, changes in attitude and public policy regarding driving while sleepy will likely happen as a result of interest (and profit) from the legal profession rather than from common sense and irrefutable scientific facts. An increasing number of multimillion–

dollar lawsuits generated by motor vehicle crashes in which the driver falls asleep are being reported in the media. Societal attitudes toward drowsy driving will change only when the expense of it outweighs the (mis)perceived benefit. **MM**

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