Preface

Sleep and sleep disorders: an overview

Guest Editor

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Sleep is a universal phenomenon that occupies nearly a third of human existence. Three basic mechanisms regulate the states of sleep and wakefulness: balance of the autonomic nervous system (sleep is associated with increased parasympathetic activation and decreased sympathetic drive), homeostatic sleep drive (increased sleepiness follows longer periods of wakefulness), and circadian sleep–wake rhythms.

Sleep influences most physiologic processes in the body, and is, in turn, affected by specific sleep, circadian, medical, neuropsychiatric and behavioral disorders, the sleep environment itself, and medication usage. Sleep loss and deprivation is associated with significant health, safety, and economic consequences and greatly impacts performance at school and in the workplace, quality of life, and social interactions. It is not merely a clinical problem physicians face regularly but a societal issue that needs to be addressed by medical professionals, educators, legislators, and entrepreneurs.

Patients who complain of insomnia report an inability to fall asleep or to remain asleep, or that their sleep is short and inadequate, light and easily disrupted, or nonrestorative. In western industrialized nations, approximately 30% to 40% of individuals report occasional or intermittent periods of sleep disturbance, and an estimated 10% to 15% suffer from chronic insomnia. The prevalence of insomnia is higher among women; the elderly; substance users; persons who are widowed, divorced or separated; and individuals with medical or psychiatric illnesses. An estimated 25% to 50% of patients with insomnia have an underlying psychiatric pathology; in addition, the risk of developing a psychiatric illness within 1 year of the
Diagnosis of insomnia is inordinately greater compared to the general population. Consequences of insomnia include an increased likelihood of accidents and absenteeism, diminished performance, impaired judgment, polydrug abuse (including alcoholism), increased use of health care resources, decline in quality of life, and disturbance in interpersonal relationships. It is crucial that short-term sleep disturbance be promptly recognized and appropriately treated before learned habits, attitudes, and coping mechanisms incongruous with sleep become established and perpetuate the sleep disturbance. Many a chronic insomnia has its origins in transient disruptions of sleep that were allowed to take root. Therapy has to address the predisposing, precipitating, and perpetuating factors of insomnia.

Narcolepsy is characterized by the clinical tetrad of excessive sleepiness, cataplexy (sudden loss of muscle tone provoked by strong emotion), sleep paralysis (an inability to move for seconds to minutes during the transition into or out of sleep), and hallucinations (during the transition from wakefulness to sleep [hypnagogic] or from sleep to wakefulness [hypnopompic]). Excessive sleepiness is a lifelong condition and may manifest as pervasive drowsiness, frequent napping, and unexpected and overpowering sleep attacks. Repetitive awakenings, automatic or inappropriate behavior, and memory impairment are associated features. It affects an estimated 0.03% to 0.16% of the general population and appears to be due to a disorder of neurons located in the posterior hypothalamus that produce the neuropeptide orexin (also known as hypocretin). Excessive sleepiness in persons with idiopathic hypersomnia manifests as extended major sleep episodes (lasting over 8 hours) and prolonged naps (up to 1–2 hours). Auxiliary symptoms of narcolepsy are absent. Recurrent hypersomnia can manifest in two forms: hypersomnia only (monosymptomatic type) or accompanied by binge eating and hypersexuality (Kleine-Levin syndrome). Episodes of excessive sleepiness typically occur weeks or months apart.

Individuals with obstructive sleep apnea syndrome (OSAS) present with complaints of frequent episodes of obstructive breathing during sleep. These respiratory events are commonly associated with loud snoring, arterial oxygen desaturations, and arousals. They typically recur throughout the evening, at times reaching numbers substantial enough to produce sleep fragmentation and subsequent daytime sleepiness. OSAS tends to affect middle-aged individuals and is strongly associated with obesity. An estimated 4% of men and 2% of women between the ages of 30 and 60 years in the United States have OSAS. Other predisposing factors include hypothyroidism, acromegaly, and structural abnormalities of the head and face such as adeno-tonsillar hypertrophy, macroglossia, or micrognathia. OSAS increases the risk for hypertension, heart failure, and cerebrovascular disease. It has also been implicated in the pathogenesis of pulmonary hypertension, nocturnal cardiac ischemia, and nocturnal arrhythmias.

The endogenous biologic rhythm controlling the propensity for sleep and wakefulness is normally highly synchronized to environmental time cues.
such as the light–dark cycle. Nonphotic influences such as physical activity and social pursuits also synchronize the external environment and the internal circadian clock. Misalignment between the desired sleep time and the timing of the circadian sleep rhythm results in complaints of insomnia or excessive sleepiness. Jet lag and shift work sleep disorder occur when the timing of the external environment is shifted relative to the internal circadian clock. On the other hand, circadian rhythm sleep phase disorders—including delayed sleep phase syndrome, advanced sleep phase syndrome, non–24-hour sleep/wake syndrome, and irregular sleep wake pattern—are due to chronic alterations in the circadian system, and affected individuals are unable to achieve or persistently maintain conventional sleep times.

Restless leg syndrome (RLS) is characterized by an uncomfortable or unpleasant sensation involving the lower extremities that becomes apparent during periods of rest or inactivity and is accompanied by an irresistible urge to move the limb. Leg movements temporarily relieve this creeping, crawling, or aching sensation, either partially or completely. When these sensations occur before the desired sleep time, persons may experience difficulty falling asleep. In periodic limb movement disorder (PLMD), recurrent, almost rhythmic limb movements occur during sleep. Most affected individuals are unaware of these repetitive limb movements; in addition, many of them are asymptomatic. Nonetheless, these stereotypical jerks can partially arouse or awaken the individual, leading to sleep fragmentation and complaints of insomnia or hypersomnolence. Approximately 70% to 90% of patients with RLS will have PLMD; conversely, one third of those with PLMD will have RLS. A defect in dopaminergic function may underlie both disorders. Altered iron metabolism and hypocretin mechanisms have also been suggested.

Parasomnias are undesirable physical, behavioral, or experiential phenomena that intrude upon an individual’s sleep. The states of sleep (rapid eye movement [REM] and non–rapid eye movement) and wakefulness are not mutually exclusive, and their various components may oscillate rapidly between states or occur simultaneously. Parasomnias generally manifest as activation of skeletal muscles or the autonomic nervous system and tend to occur during the transition from one state to another. The common primary sleep parasomnias include disorders of arousal (eg, confusional arousals, sleepwalking, and sleep terror) and REM sleep behavior disorder.

Significant differences exist in sleep between women and men, particularly during the phases of the menstrual cycle, pregnancy, the postpartum period, and menopause. This is partially related to the changing hormonal milieu that occurs across the life cycle. Women with premenstrual syndrome and premenstrual dysphoric disorder often report sleep-related complaints such as insomnia, restless sleep, hypersomnolence, and disturbing dreams. Premenstrual insomnia, premenstrual hypersomnia, and menopausal insomnia have been described as well.

Alterations in sleep architecture and the sleep–wake cycle are encountered commonly in the elderly. Approximately half of older adults complain
of sleep difficulty, including insomnia, sleep-disordered breathing, and REM sleep behavior disorder. However, sleep disturbance is not an inevitable consequence of aging; rather it is often due to a variety of disorders and the medications used to treat them. Frequent nighttime awakenings accompanied by confusion and wandering is a common cause for institutionalization among the elderly.

Sleep influences the course and prognosis of several cardiovascular, respiratory, renal, gastrointestinal, infectious, rheumatologic, and endocrine disorders. Likewise, sleep quality and architecture may be altered by medical disorders.

Almost every medication has some effect on sleep, either as a primary therapeutic effect of the drug or as an adverse reaction. Antidepressants, lithium, antipsychotics, sedative hypnotics, anti-Parkinsonian drugs, anticonvulsants, opiates, and antihistamines can induce hypersomnolence. On the other hand, insomnia can complicate therapy with stimulants, theophylline, antidepressants, beta-adrenergic blockers, decongestants, and corticosteroids. Alcohol use can give rise to both insomnia and sedation. Serotonin receptor blockers, tricyclic antidepressants, beta-adrenergic blockers, Amiodarone, Clonidine, Methyldopa, Reserpine, Temazepam, Risperidone, Clozapine, Levodopa, and Amantadine can produce nightmares. REM sleep behavior disorder has been reported following the administration of monoamine oxidase inhibitors, tricyclic antidepressants, Venlafaxine, Fluoxetine, Selegiline, and Donepezil.

In this issue of the Medical Clinics of North America, I have attempted to incorporate the essential features of common sleep disorders. I wish to express my sincere gratitude to the authors who have generously provided an excellent overview of the current clinical discipline of sleep medicine. I owe a special personal thanks to Heather Cullen and the excellent editorial staff at Elsevier. Finally, I am especially indebted to Edmundo Martinez, O.J. Bizzozero, Richard Matthay, Carl Sherter, Charles Polnitsky, Jock Lawrason, John Brackett, Vahid Mohsenin, Michael Sateia, W. David Brown, James Leiter, and F. Charles Hiller for their counsel, generosity, and unwavering support over the last quarter of a century.

This issue is dedicated to my wife, Grace, and to my daughter, Zoe, who each day remind me that life is indeed good.

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