

EXCESSIVE SLEEPINESS

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Christian Guilleminault and Kannan Ramar

The Investigation of Sleepiness 1

Michael H. Silber

Pathologic sleepiness is a fundamental symptom of sleep disorders. Mechanisms include increased sleep debt, circadian dysrhythmias, and decreased wakefulness drive. A detailed clinical history from the patient and observers, aided by quantitative sleepiness scales, is essential. Polysomnography and the Multiple Sleep Latency Test are the investigations most often required to reach a diagnosis. Other tests, such as the maintenance of wakefulness test, may be helpful in selected situations.

Epidemiology of Excessive Daytime Sleepiness 9

Maurice M. Ohayon

Excessive daytime sleepiness (EDS) has not been as extensively studied in the general population as insomnia. This article reviews more than 20 epidemiologic studies performed in different parts of the world. EDS has been defined in various ways, making comparisons between the studies hazardous. EDS was not gender-related in most of the studies. Evolution with age has given conflicting results. It has been associated with sleep-disordered breathing, mental disorders, and physical illness. Studies that used similar methodologies suggest that cultural differences might be involved in the observed differences in prevalence. From these studies, however, it seems that a uniform operational definition of EDS is still missing, jeopardizing the interpretation of the findings.

Sleepiness and Circadian Rhythm Sleep Disorders 17

Torbjörn Åkerstedt

Circadian rhythm sleep disorders are caused by a mismatch between the sleep-wake pattern and circadian phase. Sleep at the circadian high is impaired, while alertness is reduced during wakefulness. This article explores the various circadian rhythm sleep

disorders, including shift work sleep disorder, jet lag sleep disorder, delayed sleep phase syndrome, advanced sleep phase syndrome, non-24-hour sleep syndrome, and irregular sleep syndrome.

Sleep Deprivation and Sleepiness Caused by Sleep Loss

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Scott M. Leibowitz, Maria-Cecilia Lopes, Monica L. Andersen, and Clete A. Kushida

Sleep deprivation and sleep loss are pervasive in modern society, largely stemming from societal demands of increased productivity. This increased productivity does not come without a cost to basic physiologic processes that have been explored by animal and human sleep deprivation research over the last century. These studies have provided some understanding of the molecular and neurochemical ramifications of sleep loss, and the circadian and homeostatic processes involved with sleep-wake mechanisms. Clinicians have several tools to assess daytime sleepiness as a consequence of sleep loss, and often this sleep loss is related to sleep and medical conditions. A better understanding of the causes and consequences of sleep loss can lead to recognition and curtailment of voluntary sleep deprivation and management of disorders that result in sleep loss.

Narcolepsy

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Seiji Nishino

Narcolepsy is characterized by excessive daytime sleepiness, cataplexy, and other dissociated manifestations of rapid eye movement sleep. The major pathophysiology of human narcolepsy has recently been revealed by the extension of discoveries of narcolepsy genes in animal models. This directly led to the development of new diagnostic tests. The disease is currently treated with amphetamine-like compounds and modafinil for excessive daytime sleepiness and anticataplectics for cataplexy. Clinical, pharmacologic, pathophysiologic aspects of narcolepsy and future directions are discussed.

Excessive Daytime Sleepiness and Obstructive Sleep Apnea Syndrome

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Kannan Ramar and Christian Guilleminault

Daytime sleepiness is a major symptom of obstructive sleep apnea syndrome and presents great public health concern. The underlying mechanisms are poorly understood. Poor correlation often exists between subjective and objective test measures, but new analytic methods have given hope for better results. Further study and validation of these methods, and development of alternative subjective and objective tests for sleepiness, will facilitate the clinical assessment of excessive daytime sleepiness. Compliance with the primary treatment must be maintained during provision of supplemental medication to sustain healthy outcomes.

Chronic Hypersomnia

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Yves Dauvilliers and Michel Billiard

Although considerable progress has been made in understanding hypersomnia, the pathophysiology of idiopathic hypersomnia (IH) is still totally unknown. This article details the concept of IH with long sleep time and without long sleep time, and reports the main differential diagnosis. Also explored is hypersomnia caused by medical conditions, hypersomnia following infection, and nonorganic hypersomnia. There is a definite need further to develop sleep laboratory investigations to assess the correct diagnosis. Studies at the genetic and biologic levels are also needed to further the understanding of the pathophysiology of IH and to develop specific treatment.

The Kleine-Levin Syndrome 89*Yu-Shu Huang and Isabelle Arnulf*

The essential clinical criterion of Kleine-Levin syndrome (KLS) is recurrent episodes of hypersomnia. Patients have to experience at least one of the following symptoms during the episodes: (1) cognitive disturbances, (2) megaphagia, (3) hypersexuality, (4) irritability or odd behavior. Recent imaging studies have shown involvement of the thalamus, and raise the question of persistent hypoperfusion in some brain areas during the asymptomatic period. There is no clear etiology for the syndrome, although some more frequent HLA genotypes suggest a possible auto-immune mediation of the disease. No treatment as been shown systematically to improve KLS despite many trials with drugs. No therapeutic recommendation can be made today.

Sleepiness in Children 105*Sarah Blunden, Timothy F. Hoban, and Ronald D. Chervin*

Sleepiness is a common often underdiagnosed problem in children. Causes lie in both intrinsic and extrinsic sleep disorders of either a primary or secondary nature. Daytime sequelae of sleepiness in children include neuropsychologic and psychosocial deficits.

Neuromuscular Disorders and Sleepiness 119*Stephen N. Brooks*

Excessive daytime sleepiness (EDS) is a common symptom among patients with neuromuscular disease and may have a significant negative impact on the health and well-being of these individuals. Sleep-disordered breathing is often the most important cause of EDS in these patients. Additional causes of EDS in patients with neuromuscular disease may include nocturnal sleep disruption from pain, secretions, limited mobility or abnormal movements, central nervous system involvement as part of the primary disorder, or even medications used to treat the neuromuscular disease. With awareness of the problem, appropriate evaluation can lead to effective treatment of EDS in most of these cases.

Parkinson's Disease and Sleepiness 127*Alex Iranzo*

Sleepiness in Parkinson's disease is a common and complex phenomenon that may lead to automobile accidents and social problems because of excessive daytime somnolence and events of sudden-onset sleep. Sleepiness in Parkinson's disease is multifactorial. The main contributing factors are the intrinsic pathology of the disease itself and the sedative effects of dopaminergic agents used in its treatment.

Poststroke Hypersomnia 139*Claudio L. Bassetti and Philipp Valko*

Hypersomnia, defined as excessive sleepiness or sleep-like behavior, can reflect insufficient arousal following disruption of the arousal systems or increased production of sleep. Poststroke hypersomnia affects about 20% of patients with stroke. Severe and persistent hypersomnia is suggestive of a bilateral paramedian thalamic or mesencephalic stroke and large hemispheric strokes with mass effect. Poststroke hypersomnia can be documented by actigraphy, whereas the correlation with wake and sleep EEG is relatively poor. Persistent poststroke hypersomnia can occasionally be improved with stimulants or dopaminergic drugs.

Periodic Leg Movements in Sleep and Restless Legs Syndrome Relation to Daytime Alertness and Sleepiness

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Richard P. Allen

It has been assumed that periodic leg movements in sleep and the frequent arousals associated with them cause clinically significant insomnia and daytime sleepiness, but studies do not support this relationship. Restless legs syndrome (RLS) is associated with decreased sleep efficiency and short sleep times. RLS studies have consistently failed to find presence of the daytime sleepiness expected for the short sleep time. Some of the other effects of chronic sleep deprivation have been shown clinically and one recent report documented the expected cognitive impairment of frontal lobe function. RLS patients seem to have some altered arousal increasing alertness and overcoming sleepiness despite profound sleep loss.

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