Review

Psikiyatride Güncel Yaklaşımlar-Current Approaches in Psychiatry 2026; 18(3):1125-1139

doi: 10.18863/pgy.1701527

Management of Sleep Disorders in General Medicine

Genel Tıpta Uyku Bozukluklarının Yönetimi

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ABSTRACT

Sleep is one of the fundamental cycles of human life, involving complex neurophysiological processes that are activated each night as the eyes close, and it has been a subject of curiosity since antiquity. Advances in scientific methods during the 19th and 20th centuries enabled major progress in understanding sleep physiology. Techniques such as electroencephalography (EEG), polysomnography, and actigraphy facilitated the delineation of rapid eye movement (REM) and non-rapid eye movement (NREM) stages, thereby elucidating the pathophysiology of sleep disorders. Contemporary research demonstrates that sleep disorders are not merely individual issues related to nighttime rest but constitute a significant global public health concern. They are associated with cardiovascular diseases, metabolic syndrome, immune dysfunction, psychiatric disorders, and accident risk, among other adverse outcomes. Evidence further suggests an increasing prevalence of sleep disorders worldwide. This review seeks to provide a comprehensive perspective on sleep, encompassing current classification systems, pathophysiological mechanisms, and treatment approaches. The limited number of recent publications addressing the full spectrum of sleep disorders highlights the need for integrative reviews. By employing a traditional review method, this article aims to draw attention to this gap in the literature. In conclusion, sleep disorders should not be confined to the domains of psychiatry and neurology alone but should be integrated into routine clinical assessments across disciplines. Because sleep affects the entire organism, recognition by all branches of medicine is essential for ensuring that it receives the attention it warrants.

Keywords: Sleep, sleep disorders, treatment

ÖZ

Yaşamın temel döngülerinden biri olan uyku, her gece gözlerin kapanmasıyla birlikte arka planda son derece karmaşık nörofizyolojik süreçlerin devreye girdiği bir olgu olup eski çağlardan beri insanlarda merak uyandırmıştır. 19. ve 20. yüzyıllarda bilimsel tekniklerin gelişmesiyle birlikte uyku fizyolojisinin anlaşılmasında önemli ilerlemeler kaydedilmiştir. Elektroensefalogram (EEG), polisomnografi (PSG) ve aktigrafi gibi yöntemlerle Hızlı Göz Hareketleri (REM) ve Hızlı Göz Hareketleri Olmayan (NREM) evreleri ayrıntılı şekilde tanımlanmış, uyku bozukluklarının patofizyolojisi büyük ölçüde aydınlatılmıştır. Günümüzde ise uyku bozukluklarının yalnızca gece uykusunu etkileyen bireysel bir sorun olmadığı; kardiyovasküler hastalıklardan metabolik sendroma, immün sistem ve ruhsal hastalıklara ve trafik kazalarına kadar birçok sağlık sorunuyla ilişkili, küresel ölçekte etkileri olan ciddi bir halk sağlığı problemi olduğu anlaşılmıştır. Mevcut araştırmalar uyku bozukluklarının görülme sıklığında bir artış olduğunu göstermektedir. Bu derleme çalışması, uykuyu güncel sınıflama sistemlerine, patofizyolojiden tedavi yaklaşımlarına kadar geniş bir çerçevede değerlendiren bütüncül bir bakış sunmayı amaçlamaktadır. Literatürde uyku bozuklarının bütününü kapsamlı olarak ele alan, güncel çalışmalar sınırlı sayıda olup, mevcut bilgileri gözden geçiren derlemelerin eksikliği göze çarpmaktadır. Geleneksel derleme yöntemi ile hazırlanan bu çalışma literatürdeki bu eksikliğe dikkat çekmeyi hedeflemektedir. Sonuç olarak uyku bozuklukları yalnızca psikiyatri ve nörolojinin ilgilendiği bir alan olmaktan çıkarılmalı, rutin değerlendirme süreçlerinin bir parçası haline getirilmelidir. Organizmanın bütününü etkileyebilen uykunun, tüm tıbbi branşlarca hak ettiği ilgiyi görmesi ancak bu şekilde mümkündür.

Anahtar sözcükler: Uyku, uyku bozuklukları, tedavi

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Received: 04.06.2025 | **Accepted:** 21.11.2025

Introduction

Sleep is a highly complex neurophysiological process involving the recovery and repair of the nervous system, the organisation and storage of information acquired during wakeful-ness, and the preparation of the cerebral cortex for subsequent periods of wakefulness (Falup-Pecurariu et al. 2021). The history of sleep and sleep research is long and varied. Examples range from sleep temples and healing rituals in ancient Egypt to Alkmaion's the-ory of sleep and the flow and balance approaches based on yin and yang in Chinese medici-ne (Karadağ and Ursavaş 2007, Gökçay and Arda 2013). While sleep was once considered a passive state of rest, the recording of brain waves and the identification of sleep stages re-vealed its critical importance to all physiological processes, including those of the immune and endocrine systems (Pelayo et al. 2010).

Poor sleep can lead to endothelial dysfunction, oxidative stress, the progression of athe-rosclerosis, inflammation, autonomic dysfunction, disruption to the hypothalamic–pituitary–adrenal axis, insulin resistance, metabolic disturbances, and cognitive impairment (Luyster et al. 2012, Bhaskar et al. 2016, Liu et al. 2025). Given this, sleep disorders, which play a role in the pathophysiology of many medical and psychiatric conditions, represent a significant clinical concern in general medical practice (Lamberg 2000). Increasing rates reported in studies suggest that sleep disorders will become a public health issue in the futu-re, highlighting their importance in general medical practice (Grandner 2017). Notably, the-re is a bidirectional relationship between sleep disorders and medical comorbidities, with patients often seeking medical attention for sleep problems prior to being diagnosed with neurodegenerative diseases. Increased awareness of this issue could transform the diagnos-tic process and treatment for these diseases. It has been reported that improving clinicians' competence in recognising and managing sleep disorders can enhance patients' quality of li-fe (Iranzo et al. 2006).

Although numerous studies have been conducted on the aetiology, epidemiology, diagnosis and treatment of various sleep disorders, research into the management of sleep disorders within the field of general medicine is limited. There is a need for comprehensive, up-to-date reviews from which clinicians can benefit. This study was conducted using traditional review methods, drawing on Turkish and English academic sources published in the PubMed, Scopus, Web of Science, Google Scholar and ULAKBIM databases. The literature search was limited to studies published after 2000. This study aims to present a general approach to sleep disorders in light of the latest information, emphasising their clinical importance in general medical practice, with the ultimate goal of incorporating sleep into routine assessment processes.

Classification of Sleep Disorders

Most people experience sleep-related problems at some point in their lives. Accurately classifying sleep disorders enables a differential diagnosis, which is the first step towards appropriate treatment. Currently, two main approaches are used for this classification. The first is the section titled 'Sleep-Wake Disorders' in the fifth edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5), published by the American Psychiatric Association (APA 2013). The second is the International Classification of Sleep Disorders, Third Edition (ICSD-3), developed by the American Academy of Sleep Medicine (AASM 2023). The World Health Organization's (WHO) International Classification of Diseases (ICD-11) also contains a classification for sleep disorders (WHO 2022). Table 1 provides an overview of the various classifications of sleep disorders.

Etiology of Sleep Disorders

Although significant progress has been made in developing techniques to evaluate sleep, the pathophysiology of sleep and sleep disorders remains unclear. To date, research indicates that sleep disorders may have a complex aetiology influenced by environmental, genetic, psychological and behavioural factors (Maski et al. 2021, Baranwal et al. 2023, Liu et al. 2025). Factors thought to play an important role in the aetiology of sleep disorders include: inadequate sleep hygiene, medical diagnoses

that affect sleep, such as diseases of the central, circulatory, and nervous systems, comorbid psychiatric disorders, and medication and substance use (Şenel et al. 2023). Table 2 outlines the factors that contribute to the development of sleep disorders.

Table 1. Commonly used classification systems for sleep disorders

Category	ICSD-3-TR	DSM-5	ICD-11
Insomnia	Chronic insomnia Short-term insomnia Other insomnia Isolated symptoms and variants Excessive time in bed Short sleepers	Insomnia disorder	Chronic insomnia Short-term insomnia Unspecified
Excessive Sleepiness / Hypersomnolence	Narcolepsy type 1 Narcolepsy type 2 Idiopathic hypersomnia Kleine-Levin syndrome Hypersomnia due to medical diseases Hypersomnia due to drug and substance use Hypersomnia due to psychiatric illnesses Poor sleep syndrome Isolated symptoms and variants Long sleepers	Excessive sleepiness disorder	Narcolepsy Idiopathic hypersomnia Kleine-Levin Syndrome Hypersomnia due to a medical condition Hypersomnia due to a drug or substance Hypersomnia associated with a mental disorder Poor sleep syndrome Unspecified
Narcolepsy	It is included in the central disorders of hypersomnolence.	Narcolepsy	It is among the hypersomnolence disorders.
Breathing-Related Sleep Disorders	Obstructive sleep apnea syndrome Central sleep apnea syndrome Sleep-related hypoventilation syndromes Sleep-related hypoxemia syndrome Isolated symptoms and variants Snoring Catathrenia	Obstructive Sleep Apnea Hypopnea Central Sleep Apnea Sleep-related hypoventilation	Central sleep apnea Obstructive sleep apnea Sleep-related disorders of hypoventilation or hypoxemia Unspecified
Circadian Rhythm Disorders	Delayed sleep-wake phase disorder Advanced sleep-wake phase disorder Irregular sleep-wake rhythm disorder Non-24-hour sleep-wake rhythm disorder Shift work Jet lag Unspecified circadian rhythm disorders	Circadian rhythm sleep disorders	Delayed sleep-wake phase disorder Advanced sleep-wake phase disorder Irregular sleep-wake rhythm disorder Non-24-hour sleep-wake rhythm disorder Shift work Jet lag Unspecified
Parasomnias	NREM-related parasomnias Arousal disorders Confusional arousals Sleep walking Sleep terrors Sleep-related eating disorders REM-related parasomnias REM sleep behavior disorder Recurrent isolated sleep paralysis Nightmare disorder Other parasomnias Exploding head syndrome Sleep-related hallucinations Sleep enuresis Parasomnias due to medical conditions Parasomnias due to drug or substance use Non-specific parasomnias	Non–rapid eye movement sleep (NREM) arousal disorders Nightmare Disorder • Rapid Eye Movements (REM) Sleep Behavioral Disorder	NREM-related REM-related Unspecified

Table 1. Commonly used classification systems for sleep disorders

Category	ICSD-3-TR	DSM-5	ICD-11
Sleep-Related Movement Disorders	Restless leg syndrome Periodic limb movements Sleep-related leg cramps Sleep-related bruxism Sleep-related rhythmic movement disorders Benign sleep myoclonus of infants Propriospinal myoclonus at the onset of sleep Sleep-related movement disorders due to medical diseases Sleep-related movement disorders due to drug or substance use Unspecified sleep-related movement disorders	Restless Leg Syndrome	Restless leg syndrome Periodic limb movement disorder Sleep-related leg cramps Sleep-related bruxism Sleep-related rhythmic movement disorder Benign sleep myoclonus of infancy Sleep-related movement disorders due to a medical condition Sleep-related movement disorders due to drug or substance use Unspecified
Substance/Drug Induced	It is not included as a separate category, but in the relevant disorder subcategories.	Substance or Medication Induced Sleep Disorder	In ICD-11, additional coding is done under the relevant disorder, not directly coded.
Other / Unspecified	Other sleep disorders	Identified / Unspecified sleep-wake disorders	Other specially defined, Unspecified

DSM-5: Diagnostic and Statistical Manual of Mental Disorders Fifth Edition, ICD-11: International Classification of Diseases Eleventh Edition, ICSD-3-TR: The American Academi of Sleep Medicine International Classification of Sleep Disorders Third Edition Text Revision, NREM: Non-rapid eye movement, REM: Rapid eye movement

Table 2. Etiology of sleep disorders

Disorder	Etiological Factors	Examples / Explanations
Insomnia	Environmental, genetic, psychological, and behavioral factors, neurobiological changes, medications, medical comorbidities	Many models and explanations have been proposed, such as the stimulus control model, the Spielman model, the neurocognitive model, and the hyperarousal theory. Neurobiological contributors include hyperactivation of the prefrontal and anterior cingulate cortices and dysregulation of the orexin/hypocretin, GABA, and adenosine systems.
Respiratory Sleep Disorders	Genetic predisposition, anatomical abnormalities, central nervous system disorders, metabolic factors, environmental triggers, medication/substance use	Obstructive sleep apnea: genetic predisposition, anatomical variations, obesity Central sleep apnea: respiratory center dysfunction, medications, other medical conditions Hypoventilation syndromes: anatomical disorders, neuromuscular diseases, obesity, drugs
Central Disorders Of Hypersomnolence (including Narcolepsy)	Genetic factors, autoimmune mechanisms, CNS diseases, medications and psychoactive substances	Narcolepsy Type 1: autoimmune process, loss of orexin neurons Narcolepsy Type 2: possible partial loss of orexin Secondary narcolepsy: brain lesions Others: Kleine-Levin syndrome, drug/substance, psychiatric disorder, sleep deficiency syndrome
Circadian Rhythm Sleep-Wake Disorders	Disruption of endogenous circadian rhythms, environmental, behavioral, and genetic factors, neurobiological alterations, medication effects	Endogenous rhythm abnormalities Jet lag, shift work, inappropriate light exposure Incompatibility of internal rhythm and environmental stimuli
Parasomnias and Movement Disorders	Neurological diseases (e.g., epilepsy, neurodegenerative disorders), metabolic abnormalities, medications, psychoactive substances	Metabolic: hypoglycemia, electrolyte imbalances, vitamin deficiencies Neurological: epilepsy, neurodegenerative diseases, central nervous system pathologies Drugs and psychoactive substances

Epidemiology of Sleep Disorders

Epidemiological studies indicate that sleep-related complaints are prevalent in the gene-ral population and that sleep quality is deteriorating at an accelerating rate (Morin and Jar-rin 2022). In the United States, for instance, more than 40 million individuals are affected by chronic sleep and wakefulness disorders, with over a third (35%) experiencing difficulty in both falling and staying asleep (Hossain and Shapiro 2002). A study of 2,089 participants in the Netherlands found sleep disorders to be prevalent in 32.1% of people. Insufficient sleep affected 43.2% of people, insomnia, 8.2%, circadian rhythm sleep disorders, 5.3%, pa-

rasomnias, 6.1%, hypersomnolence, 5.9%, restless legs syndrome and sleep-related limb movements 12.5%, and sleep-related breathing disorders, 7.1%. Two or more concurrent sleep disorders were present in 12.2% of participants (Kerkhof 2017). According to the Na-tional Sleep Epidemiology Survey of the Adult Population conducted in Turkey, sleep di-sorders affected 21.8% of the population (17.0% of men and 26.3% of women)(Benbir et al. 2015). A recent study found that sleep problems and disorders had increased by around 60% since 2010 (Klimt et al. 2023).

Clinical Presentation of Sleep Disorders

The clinical manifestations of sleep disorders — the main reasons why patients seek medical attention — vary depending on the underlying disorder (Öztürk and Uluşahin 2023, Şenel et al. 2023, Cirelli 2025). Those with sleep disorders may visit a doctor because they have difficulty falling asleep, experience frequent awakenings, feel sleepy during the day, have sleep attacks, have altered sleep patterns, have nightmares, have fearful awakenings, feel irritable, feel restless, and have anxiety symptoms (Palagini et al. 2024). They often experience difficulties at work or school, attention problems, work-related accidents, traffic accidents, and an exacerbation of existing psychiatric illnesses (Uehli et al. 2014, Chattu et al. 2018). Table 3 lists the clinical manifestations of sleep disorders and their potential effects.

Table 3. Clinical presentation of sleep disorders

Disorder	Clinical features/symptoms	Possible Consequences / Effects
Insomnia	Difficulty falling asleep Sleep fragmentation, waking up earlier than desired Performance anxiety related to sleep	Pronounced daytime fatigue and reduced energy levels Measurable decline in cognitive processing efficiency and psychomotor performance Clinically significant impairment in occupational, academic, and social functioning Decreased sustained attention, vigilance, and intrinsic motivation Increased risk of occupational and motor-vehicle accidents Affective disturbances characterized by irritability, inner restlessness, and depressive affect Neurovegetative symptoms such as headache, dizziness, orthostatic hypotension, and episodic syncope
Hypersomnolence and Narcolepsy	Excessive daytime sleepiness Sleeping in inappropriate places Sleep drunkenness Narcolepsy: cataplexy, hypnagogic/hypnopompic hallucinations, sleep paralysis	
Circadian Rhythm Disorders	Early sleep phase: Sleeping ≥2 hours earlier Late sleep phase: Sleeping ≥2 hours later Jet lag, shift work, irregular rhythms	
Respiratory Sleep Disorders	Night: snoring, apnea, waking up gasping for air, shortness of breath, frequent waking, nocturia, night sweats Day: excessive sleepiness, morning headaches, difficulty concentrating, memory problems, depressive mood, dry mouth	
Parasomnias and Movement Disorders	Sleepwalking Behaviors that may harm oneself or others Unremembered activities Need to move the extremities	

Diagnostic Approaches in Sleep Disorders

Clinical History

As with any illness, obtaining a comprehensive medical history is crucial when evalua-ting sleep disorders. This should not only be based on information obtained from the pati-ent, but also on information obtained from their bed partner, if possible. A thorough history should include information on sleep onset latency, difficulties falling asleep (e.g. falling as-leep earlier or later than desired, taking more than half an hour to fall asleep, experiencing hypnagogic hallucinations), problems during sleep (e.g. frequent awakenings, snoring, teeth grinding, sleep apnoea, talking in one's sleep), and the characteristics of the awakening pro-cess (Öztürk and Uluşahin 2023). In addition, sleep habits, lifestyle and how the person per-ceives these

experiences should be recorded. Taking into account the effects on functiona-lity, daily life, and mental state alongside the patient's subjective assessment is helpful for diagnosis. To reduce recall bias, patients may be asked to keep regular sleep diaries (Carney et al. 2012).

Psychometric Assessments

Various scales and questionnaires can be used alongside sleep histories to standardise assessments. Some of these tests evaluate overall sleep quality, while others inform the di-agnostic approach. The most commonly used scales are the Pittsburgh Sleep Quality Index (PSQI), the Richards-Campbell Sleep Scale (RCSS) and the Insomnia Severity Index (ISI) (Mäki 2025). The PSQI evaluates sleep quality, insomnia symptoms, sleep duration, sleep onset latency, use of sleep medication, and daytime dysfunction. It has been validated, and its reliability has been studied in Turkey (Agar et al. 1996). The RCUÖ, which assesses depth of night-time sleep, sleep onset latency, frequency of awakenings, time spent awake after awakening, sleep quality and noise level in the environment, has also been studied in Turkey (Karaman and Özer 2015). The ISI measures the severity of sleep disorders, sleep satisfaction, impairment of daily functioning, distinctiveness of the disorder and emotional distress. It has sufficient validity and reliability levels for use with Turkish samples (Boy-san et al. 2010). If another psychiatric disorder is suspected alongside sleep disorders, it is recommended that scales specific to that disorder are also used. Additionally, variables such as sleep onset latency, time to return to sleep after awakening, sleep efficiency and total sleep time are believed to be important for diagnostic evaluation (Morin and Jarrin 2022).

Physical Examination

A clinical examination, alongside a review of the patient's medical history and the re-sults of psychometric testing, is an important step in the diagnostic process. The patient's general appearance, mood, level of attention and motivation should be observed. Other me-dical conditions that may mimic or exacerbate sleep disorders must also be investigated, as must the patient's current medication and dosage schedule.

Laboratory and Imaging Studies

When a comorbid condition is suspected, the evaluation should be supported by relevant laboratory tests and imaging studies. For example, echocardiography is recommended for suspected heart failure, thyroid function tests for hyperthyroidism, fasting blood sugar and haemoglobin A1C tests for diabetes mellitus, urea and creatinine level tests for kidney dise-ase, and serum iron level tests for restless legs syndrome (Allen et al. 2005). Specialised devices and laboratory methods are also employed in modern sleep medicine. In actigraphy, for instance, the sleep-wake cycle is recorded using a wrist-worn device (Thomas and Gamble 2025). This method is used to evaluate disorders such as restless legs syndrome, circadian rhythm disorders and obstructive sleep apnoea (Thomas and Gamble 2025). It has also been suggested that it can be used to monitor symptom severity and treatment effecti-veness (Sadeh 2011). Polygraphy, on the other hand, is the gold-standard method for recor-ding parameters such as electroencephalography (EEG), electrooculography (EOG), elect-romyography (EMG) and electrocardiography (ECG) during sleep (Kramer and Millman 2025). It is indispensable for diagnosing sleep-related breathing disorders in particular. However, PSG has also been found useful for evaluating other sleep disorders (Epstein et al. 2009, Takahashi 2017, Bassetti et al. 2019, Rundo and Downey 2019).

Differential Diagnosis of Sleep Disorders

Poor sleep has numerous biological effects on the metabolic, endocrine, and immune systems (Garbarino et al. 2021). It has been suggested that poor sleep should be considered a risk factor for obesity, type 2 diabetes, hypertension, cerebrovascular diseases and cardio-vascular diseases (Chasens et al. 2021). Poor sleep has also been linked to endothelial dys-function, oxidative stress, the progression of atherosclerosis, inflammation, autonomic dys-function, disruption of the hypothalamic–pituitary–adrenal axis, insulin resistance, metabo-lic effects and mood and cognitive changes (Garbarino et al. 2021). However, this relations-hip is bidirectional. Many medical conditions, such as cardiovascular disease, chronic obst-

ructive pulmonary disease (COPD), diabetes, gastro-oesophageal reflux disease, thyroid di-sorders, kidney disease and severe liver disease, can negatively affect sleep physiology and lead to sleep disturbances. Symptoms associated with physical illnesses, such as coughing, itching, pain, shortness of breath, and frequent urination, can also affect sleep. Furthermore, certain medications, such as antidepressants, stimulants, corticosteroids, anticholinergics, antiepileptics, beta-blockers and theophylline, can cause or exacerbate sleep disorders (Roehrs and Roth 2024). Table 4 summarizes the conditions that should be considered in the differential diagno-sis of sleep disorders.

Table 4. Differential diagnosis of sleep disorder

Differential Diagnosis	Examples
Cardiovascular Diseases	Heart failure, cardiomegaly, and uncontrolled hypertension
Respiratory System Disorders	Chronic obstructive pulmonary disease, asthma, structural airway anomalies etc
Endocrine Causes	Endocrinopathies such as hyperthyroidism, hypothyroidism, diabetes mellitus, obesity, and adrenal insufficiency
Metabolic Causes	Hypoglycemia, hyperglycemia, electrolyte imbalances (particularly sodium, calcium, and magnesium), and iron or B-vitamin deficiencies
Neurological Disorders	Epilepsy, Parkinson's disease, Alzheimer's disease, Lewy body dementia, multiple sclerosis, ALS, myotonic dystrophy, brain tumors, traumatic brain injury, stroke, and various encephalitic/paraneoplastic processes
Other Systemic Disorders	Chronic kidney diseases, Hepatic encephalopathy:,Gastroesophageal reflux disease etc.
Psychiatric Disorders	Psychiatric disorders such as anxiety disorders, mood disorders, psychotic disorders, PTSD, and somatic symptom disorders
Medications and Psychoactive Substances	Antidepressants: Marked REM sleep suppression, increased frequency of nightmares, elevated risk of developing REM Sleep Behavior Disorder Lithium and tricyclic antidepressants (TCAs): Increased NREM sleep, alterations in arousal threshold, triggering of NREM parasomnias (e.g., sleepwalking, sleep terrors) Beta-blockers and alpha-agonists: Inhibition of melatonin secretion, increased nightmares, reduced sleep continuity with frequent micro-arousals Reserpine: Increased REM sleep, occurrence of vivid and intense dream content Theophylline, ephedrine, and other stimulants: Adenosine antagonism and central nervous system stimulation, significant prolongation of sleep latency, frequent nocturnal awakenings and reduced total sleep time Alcohol, opioids, and anesthetic agents: Decreased upper airway muscle tone, exacerbation of obstructive sleep apnea, respiratory depression, disruption of sleep architecture and reduction in deep sleep

NREM: Non-rapid eye movement, REM: Rapid eye movement

Treatment of Sleep Disorders

Sleep Hygiene as a Preventive Measure

Almost everything we do in daily life, including our eating habits, has the potential to affect our sleep. 'Sleep hygiene' is a term used to describe habits that promote high-quality sleep (Baranwal et al. 2023). The first aspect of sleep hygiene to consider is your bedtime and wake-up times. It is recommended that you go to bed and wake up at the same time each day (Martin 2025). This applies to both workdays and days off. If going to bed at the same time is not possible, you should set a specific wake-up time and stick to it.

Another issue discussed was the sleep environment (Öztürk and Uluşahin 2023). This is because it must be conducive to sleep. It should be at a suitable temperature and well ventilated. It is recommended that this area is used only for sleep and intimacy, and that activities such as eating, watching television or listening to music should not take place there. Bright light or noise can negatively affect sleep hygiene. Blackout curtains, sleep masks and earplugs can be used to optimise the environment. The choice of bed, pillow and blanket can also affect sleep quality.

Excessive consumption of tea, coffee or nicotine during the day or before bedtime can negatively impact sleep quality (Yıldırım and Ersü 2023). Therefore, it is recommended that consumption of these beverages

stops by late afternoon at the latest. Although alcohol has a sedative effect, it is not an effective treatment for insomnia (He et al. 2019). In addition to its negative impact on sleep architecture, alcohol has the potential to cause addiction.

Eating a light evening meal and avoiding late-night snacks are key to a good night's sleep. Research by Kelley and Kelley (2017) has shown that doing light exercise two or three times a week, while avoiding strenuous exercise before bedtime, can improve sleep quality.

Other recommendations include going to bed when you feel sleepy rather than forcing sleep when you cannot sleep. It is also suggested that you get up and do something else be-fore going back to bed when you feel sleepy (Öztürk and Uluşahin 2023). Taking a warm shower can also help you to fall asleep more easily.

Non-Pharmacological Approaches

Numerous professional organisations recommend cognitive behavioural therapy for insomnia (CBT-I) as the primary treatment (Roniger et al. 2022). For short-term insomnia, hypnotic agents and CBT-I are equally effective. However, for long-term insomnia, CBT-I is more effective (Martin 2025). Apart from CBT-I, there are mindfulness-based practices and other therapeutic techniques, but these have not been evaluated as comprehensively.

Reports in the literature have suggested that cognitive behavioural therapy can benefit patients with non-rapid eye movement (NREM) sleep disorders (Harris and Grunstein 2009). A systematic review of psychological treatments for NREM parasomnias, including 72 publications (mostly case reports or case series), revealed that hypnosis was the most prevalent treatment (Mundt et al. 2023). Predictive arousal, whereby the patient is awake-ned shortly before an episode is expected to occur, is a non-pharmacological treatment met-hod for confusional arousals, sleep terrors and sleepwalking in children (Vaughn 2025).

In the treatment of central disorders of hypersomnolence and narcolepsy, daytime sleep forms the basis of non-pharmacological treatment for narcolepsy (Scammell 2025). In circadian rhythm disorders, gradually advancing bedtime and wake-up times toward the target is the first step in treatment.

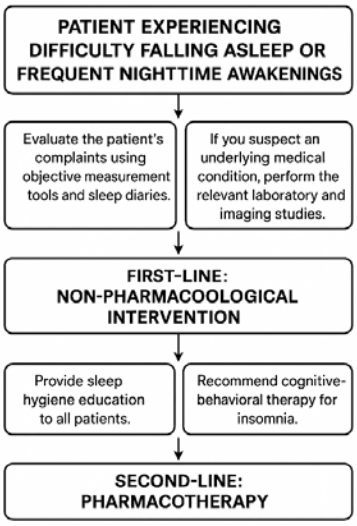

Figure 1. The clinical approach to insomnia

Somatic Approaches

Light therapy may help to reset the circadian rhythm (Goldstein 2025). Repetitive transcranial magnetic stimulation (rTMS) has been suggested as an effective treatment for sleep disorders due to its modulation of synaptic plasticity and connections between the brain regions involved in these disorders (Nardone et

al. 2020). A large, database-based study found evidence that rTMS is safe and feasible for treating chronic insomnia, obstruc-tive sleep apnoea syndrome (OSAS), restless legs syndrome (RLS) and cognitive deficits associated with sleep deprivation (Lanza et al. 2023). However, there is limited data on its use in treating narcolepsy, sleep bruxism and REM sleep behaviour disorder (Shen et al. 2024). Electroconvulsive therapy (ECT) has been proposed as a treatment for sleep disor-ders, but it has not yet been sufficiently researched. ECT has reportedly been administered to patients presenting with depressive symptoms associated with insomnia (Zhang et al. 2023).

Pharmacological Approaches

Pharmacological approaches may be preferred when non-pharmacological approaches are ineffective or a rapid response is required. The drug categories currently approved for insomnia include benzodiazepines, non-benzodiazepine hypnotics, dual orexin receptor an-tagonists (DO-RAs), melatonin receptor agonists and histamine (H1) receptor antagonists (Winklerman 2025). Additionally, antidepressants and antipsychotics may be used off-label as hypnotics (Hefner et al. 2022). The choice and dosage of a hypnotic should be determined based on the patient's age and any other medications or medical conditions they have, as well as the pharmacokinetic and pharmacodynamic properties and side-effect profiles of each drug. Figure 1 shows approaches to insomnia, and Table 5 lists commonly used medications for treating insomnia.

Table 5. Commonly used medications in the treatment of insomnia

Drug Class	Mechanism of Action	Example Agent / Clinical Use	Side Effects / Notes
Benzodiazepines	They cause an increase in the inhibitory effect through GABA-A receptors.	Triazolam: Difficulty falling asleep Temazepam: Difficulty maintaining sleep	Triazolam is a short-acting benzodiazepine and its half-life varies between 2-5 hours. It shortens the time it takes to fall asleep by an average of 6 minutes. It can be used in doses of 0.25–0.5 mg. Temazepam half-life is 8–15 hours, prolonging sleep maintenance. It can be used in doses ranging from 7.5–30 mg. Dose adjustment may be required in renal impairment. Side effects of benzodiazepines include rebound insomnia when the drug is discontinued, impaired cognitive function, morning lightheadedness, development of tolerance and dependence, Elderly patients may have an increased risk of falls and delirium.
Non-benzodiazepine Hypnotics (Z-drugs)	They show affinity for different sites of GABA-A receptors than the binding sites of benzodiazepines.	Eszopiclone: It can be used for both difficulty falling asleep and staying asleep. Zaleplon: difficulty falling asleep Zolpidem: It can be used for both difficulty falling asleep and staying asleep.	They shorten the transition time to sleep and can extend the total sleep time. It has minimal effects on REM and slow-wave sleep. With long-term use, there is a risk of developing tolerance and dependence, but it is lower than with classic benzodiazepines. Zolpidem 5–10 mg, Zaleplon 5–10 mg, Eszopiclone: It is recommended to be used in doses of 1–3 mg. Side effects include dizziness, lightheadedness, headache, daytime sedation, disorganized behaviors, complex sleep behaviors (sleepwalking, sleep eating, etc.), anterograde amnesia, dyspeptic complaints, and metallic taste in the mouth.
Dual Orexin Receptor Antagonists (DORAs)	Orexin 1 and orexin 2 receptor inhibition	Suvorexant: Difficulty maintaining sleep Lemborexant: Difficulty falling asleep Daryorexant: It can be used for both difficulty falling asleep and staying asleep.	Suvorexant 10-20 mg, lemborexant: 5-10 mg, Daridorexant 25-50 mg can be used in the dose range. It is safer than other agents in terms of the risk of falling in elderly patients, however, it should not be used in patients with narcolepsy. Side effects include headache, dizziness, drowsiness, hallucinations, sleep talking, hypnagogic hallucinations, sleep paralysis, parasomnias.
Selective Melatonin Receptor Agonists	Selective melatonin acts as a receptor agonist for MT_1 and MT_2.	Ramelteon: difficulty falling asleep	It shortens sleep latency (time to fall asleep). Since it does not affect the GABA system, there is no risk of dependence, tolerance, rebound insomnia, or withdrawal. It is suitable for long-term use. REM sleep does not change its architecture.

Table 5. Commonly used medications in the treatment of insomnia

Drug Class	Mechanism of Action	Example Agent / Clinical Use	Side Effects / Notes
	It regulates the circadian rhythm at the level of the suprachiasmatic nucleus.		It stands out because it is more tolerable than other drug groups, especially in elderly patients, and there are studies showing that it may be beneficial in delirium. It can be used as 8mg. Side effects include dizziness, fatigue, morning drowsiness, rarely increased prolactin levels, and nausea.
Histamine receptor (H1) antagonist	H1 receptor antagonism	Doxepin: Difficulty maintaining sleep	Doxepin can be used in doses of 3-6 mg to facilitate sleep and in patients who complain of night awakenings. Side effects may include dizziness, lightheadedness, and anticholinergic side effects.
Tricyclic Antidepressants	Serotonin-norepinephrine reuptake inhibitors	Amitriptyline: It can be used for both difficulty falling asleep and staying asleep.	Amitriptyline provides significant sedation at low doses. It suppresses REM sleep and can increase the rate of stage 3 (deep sleep). Tolerance development is usually slow. It is generally used in the dose range of 10–50 mg. Symptomatic treatment of depression accompanied by insomnia, cataplexy may be beneficial in cases of insomnia accompanied by pain or fibromyalgia. Side effects include dry mouth, constipation, urinary retention, blurred vision, weight gain, orthostatic hypotension, cardiac conduction disorders (especially in the elderly), morning drowsiness.
Other Antidepressants	Trazodone: antagonism of 5-HT-2A receptor, H1 receptor, and alpha-1-adrenergic receptors Mirtazapine: alpha-2 antagonism as well as potent 5-HT2 and 5-HT3 and H1 antagonist	Trazodone: It can be used for both difficulty falling asleep and staying asleep. Mirtazapine: It can be used for both difficulty falling asleep and staying asleep.	They can be advantageous in cases of depression, anxiety, or associated insomnia. Trazodone has side effects such as sedation, dizziness, dry mouth, hypotension. It can lead to an increased risk of falls in the elderly. Mirtazapine has side effects such as sedation, dry mouth, increased appetite, weight gain.
Second Generation Antipsychotics	5-HT-2A and D2 receptor antagonism	Olanzapine: It can be used for both difficulty falling asleep and staying asleep. Quetiapine: It can be used for both difficulty falling asleep and staying asleep.	It may be advantageous in psychotic patients and in patients in manic episodes in case of insomnia. It may be preferred in patients with severe depressive symptoms or anxiety symptoms.

D2 receptor: Dopamine D2 receptor, GABA: Gamma-Aminobutyric Acid, H1 receptor: Histamine H1 receptor, REM: Rapid Eye Move-ment, 5-HT-2A: 5-Hydroxytryptamine 2A receptor, 5-HT3: 5-Hydroxytryptamine 3 receptor

Modafinil, armodafinil, pitolisant and solriamfetol are recommended to promote wakefulness when treating central hypersomnia disorders and narcolepsy (Sarfraz et al. 2022). Modafinil is typically the initial treatment option (Scammell 2025). Sleepiness should be reassessed after treatment. If sleepiness has improved or reached an acceptable level, treatment should continue as before. However, if sleepiness persists, a second medication should be added to the treatment regimen. Oxybate is generally preferred for severe cases (Morse et al. 2023). Venlafaxine, fluoxetine or duloxetine may be added to the treatment regimen to control cataplexy (Jin et al. 2019). Similar medications that target daytime sleepiness are also used to treat hypersomnolence. Table 6 lists commonly used medications for hypersomnolence and narcolepsy.

Benzodiazepines, particularly clonazepam, are the preferred treatment for non-REM sleep disorders that do not respond to non-pharmacological interventions (Mainieri et al. 2023). Melatonin may improve sleep in people who sleepwalk (Holbrook et al. 2000). Selective serotonin reuptake inhibitors (SSRIs) may be preferable for treating abnormal sexual behaviour related to sleep. Although systematic pharmacological studies have not been con-ducted, positive results have been reported for treatments involving clonazepam, lamotrigine, imipramine, fluoxetine, paroxetine, escitalopram and duloxetine (Contreras et al. 2019).

Table 6. Common medications for central disorders of hypersomnolence and narcolepsy

Drug	Mechanism of Action	Primary Uses	Clinical Notes / Side Effects
Methylphenidate	It inhibits the reuptake of the neurotransmitters norepinephrine and dopamine in presynaptic neurons, while inhibiting the transport of these neurotransmitters, increasing the concentration of dopamine and norepinephrine in the synaptic space. Increases alertness in a dose-dependent manner.	Alertness enhancer	The most commonly used stimulant. Short-acting, long-acting and modified-release forms are available. It can be started with 5-10mg per day, the maximum dose in adults is 72mg/day. Side effects may include decreased appetite, nausea, headache, insomnia, potential for abuse, psychotic symptoms, mania, seizures, cardiovascular effects. There is no FDA approval for narcolepsy, it is used off-label.
Modafinil	Although the exact mechanism is unknown, it stimulates the histamine, norepinephrine, serotonin, dopamine and orexin systems. It is thought to have monoaminergic effects. It does not suppress REM sleep and does not affect sleep duration.	Excessive daytime sleepiness	In randomized controlled trials, it has provided an increase in daytime sleepiness and alertness. 100-400 mg per day can be used. Side effects may include headache, irritability, nausea, insomnia, severe rash. There is FDA approval for narcolepsy and excessive daytime sleepiness.
Armodafinil	R-enantiomer of modafinil	Excessive daytime sleepiness	It is similar to modafinil and has a longer half-life. Side effects may include headache, irritability, nausea, insomnia. There is FDA approval for narcolepsy and excessive daytime sleepiness.
Solriamfetol	It is a dopamine/norepinephrine reuptake inhibitor.	Excessive daytime sleepiness	Side effects may include headache, dizziness, insomnia, nausea, anxiety, dry mouth, palpitations. It received FDA approval in 2019. Its effectiveness in treating excessive daytime sleepiness has been proven.
Sodium Oxybate	The mechanism of action is not clear. Sodium oxybate acts primarily as a GABA-B receptor agonist. It deepens slow wave (delta) sleep. It suppresses the transition to REM sleep.	Excessive daytime sleepiness, cataplexy	Side effects may include nausea, dizziness, enuresis, vomiting, headache, confusion. It received FDA approval in 2002. It is also used in the treatment of hypersomnia due to Parkinson's disease.
Pitolisant	Histamine 3 receptor antagonist/third agonist.	Excessive daytime sleepiness, cataplexy	Side effects may include headache, difficulty falling asleep or staying asleep, nausea, dizziness, stomach pain, anxiety, weight loss. It received FDA approval in 2019. Caution should be exercised in terms of cardiac side effects.
Amphetamines	It has a stimulating effect on the central nervous system by increasing the release of dopamine, norepinephrine and serotonin.	Alertness enhancer	Side effects include decreased appetite, nausea, headache, insomnia, risk of abuse, psychotic symptoms. It is used off-label.
TCAs/SSRIs	TCAs block serotonin and norepinephrine transporters at the ends of presynaptic neurons. SSRIs selectively inhibit the serotonin transporter at the presynaptic neuron terminal.	Cataplexy management	May reduce the frequency of cataplexy. Strong evidence for efficacy is limited.
Future treatments	There are experimental studies on the cause of narcolepsy. Focused on preventing the loss of hypocretin (autoimmune theory, IVIG, gene therapy, etc.).		

FDA: Food and Drug Administration, IVIG: Intravenous Immunoglobulin, SSRIs: Selective Serotonin Reuptake Inhibitor, REM: Rapid Eye Movement, TCA: Tricyclic Antidepressants

Topiramate has been suggested as an effective treatment for sleep-related eating disorders (Winkellman et al. 2020). Melatonin and clonazepam have been shown to effectively supp-ress REM sleep behaviour disorder symptoms (Epstein et al. 2009). Melatonin is the drug of choice for treatment. It is particularly favoured for use in older adults with neurodegenera-tive disorders (Mellhuish et al. 2021). However, few studies have investigated the use of acetylcholinesterase inhibitors, such as donepezil and rivastigmine,

in the treatment of REM sleep behaviour disorder (Ringman and Simmons 2000, Di Giacopo et al. 2012). A symptomatic approach using melatonin, melatonin receptor agonists and treatment for insomnia and excessive daytime sleepiness can be used in circadian rhythm disorders (Goldstein 2025).

Future Directions

In the future, it is expected that the pathophysiological processes that currently remain unclear will be elucidated, paving the way for personalised treatment protocols. A deeper understanding of brain functions is crucial in this regard and can be achieved through advanced imaging methods and the identification of genetic and epigenetic determinants. For example, genetic variations in circadian rhythm-related genes such as CLOCK, BMAL1 and PER2 may influence the risk of developing conditions such as depression, bipolar disorder, obsessive-compulsive disorder, metabolic syndrome, obesity and cardiovascular disease. This suggests that sleep-related genetic research could contribute to other areas of medicine (Ruan et al. 2021, Samanta and Ali 2022). Furthermore, advancements in artificial intelligence technologies may improve the accuracy of existing diagnostic methods. Making cognitive behavioural therapy available via online platforms and apps could improve accessibility and potentially reduce the need for medication.

Conclusion

Sleep is a fundamental building block of a healthy life. It directly affects an individual's quality of life, cognitive performance, emotional balance and social relationships. Recent studies show that sleep disorders are becoming more prevalent worldwide. These disorders have a multifaceted aetiology involving genetic predispositions, neurological networks, hormonal imbalances, and psychosocial, environmental, and behavioural factors.

Urbanisation, constant exposure to digital stimuli, chronic stress, changes in eating habits and working conditions that do not align with the circadian rhythm all make it difficult to achieve quality sleep. These factors have turned sleep disorders into a global health problem. Disrupted sleep negatively affects an individual's daily energy levels, learning capacity, occupational safety, and social productivity. Therefore, addressing sleep disorders is critical at both individual and societal levels. Effective management requires a multidisciplinary approach. Rather than being considered solely within the scope of psychiatry and neurology, sleep disorders should be incorporated into routine assessment processes. Only then will sleep, which affects the entire organism, receive the attention it deserves from all medical disciplines.

Incorporating self-reported sleep diaries alongside objective assessment tools such as actigraphy and polysomnography, as well as international diagnostic systems such as the ICSD-3, DSM-5 and ICD-11, into the diagnostic process contributes to accurate differential diagnosis and treatment. Treatment approaches should not be limited to pharmacological interventions, but should also include various methods such as cognitive behavioural therapies, lifestyle adjustments, light therapies and new drugs such as orexin antagonists.

In conclusion, sleep is not just a state of rest, it is a vital process that helps to rebuild the body, mind and spirit. The limitations of our study stem from our use of traditional compi-lation methods. Future research should focus on systematic studies of effective sleep mana-gement and sleep disorders.

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Authors Contributions: The author(s) have declared that they have made a significant scientific contribution to the study and have assisted in the preparation or revision of the manuscript
Peer-review: Externally peer-reviewed.
Ethical Approval: This review study does not require ethical clearance.
Conflict of Interest: No conflict of interest was declared.
Financial Disclosure: No financial support was declared for this study.