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REFLECTION

International Classification of Sleep Disorders: A brief account of its history and of its importance for clinical practice

Clasificación Internacional de los Trastornos del Sueño: un breve recuento de su historia y de su importancia para la práctica clínica

Franklin Escobar-Córdoba[1,2,3] Oscar Sanabria-Rodríguez[3,4,5] Juan Manuel Hernández-Miranda[3]
Camilo Andres Escobar-Sarmiento[3] Ulises Jiménez-Correa[6,7,8]

[1] Universidad Nacional de Colombia - Bogotá Campus - Faculty of Medicine - Department of Psychiatry - Bogotá D.C. - Colombia.
[2] Hospital Universitario Nacional de Colombia - Sleep Laboratory - Bogotá D.C. - Colombia.
[3] Fundación Sueño Vigilia Colombiana (FUNDASUVICOL) - Bogotá D.C. - Colombia.
[4] Pontificia Universidad Javeriana - Faculty of Medicine - Department of Internal Medicine - Bogotá D.C. - Colombia.
[5] Hospital Universitario San Ignacio - Intensive Care Unit - Bogotá D.C. - Colombia.
[6] Universidad Nacional Autónoma de México - Faculty of Medicine - Sleep Disorders Clinic - Research Division - México City - México.
[7] Universidad Nacional Autónoma de México - Faculty of Medicine - Master and PhD program in Medical, Dental and Health Sciences - Mexico City - México.
[8] Universidad Nacional Autónoma de México - León Campus - Higher Studies National School - Continuing Education and Innovation Division - León, Guanajuato - México.

Abstract

The International Classification of Sleep Disorders (ICSD) is an essential tool for understanding, diagnosing, and treating sleep disorders. This classification was first published in 1990 as an updated version of the consensus-based classification of sleep disorders developed in 1979. Subsequently, in 2005, following a revision made in 1997, a second edition (ICSD-2) was published, which updated and expanded the classification by introducing new categories and subcategories and updating the terminology to reflect advances in sleep research during that period. In contrast to the revised ICSD-1, which utilized a three-axis classification system (diagnosis of the disorder, procedures to detect the disorder, and medical and psychiatric conditions associated with the disorder), the ICSD-2 classification system was based only on one axis, namely the diagnosis of disorder, and focused more on the disorders themselves to provide comprehensive information on each one of them to facilitate their proper identification and treatment. Given the significant progress made in the diagnosis and treatment of these disorders over the past 20 years, a third edition and a revised version were published in 2014 and 2023, respectively, to include new disorders, new knowledge on existing disorders, and new terminology.

The objective of this article is to briefly describe the main contributions of the ICSD to the understanding, diagnosis, and treatment of sleep disorders, with an emphasis on the ICSD-3-TR. It also aims to explore both the evolution of the ICSD and the importance of its use in clinical practice.

Resumen

En la actualidad, la Clasificación Internacional de los Trastornos del Sueño (ICSD, por su sigla en inglés) es una herramienta esencial para comprender, diagnosticar y tratar los trastornos del sueño. Esta clasificación se publicó por primera vez en 1990 como una actualización de la clasificación basada en el consenso de los trastornos del sueño desarrollada en 1979. Posteriormente, en 2005, y tras una revisión del texto de la ICSD-1 realizada en 1997, se publicó una segunda edición (ICSD-2), la cual actualizó y amplió la clasificación introduciendo nuevas categorías y subcategorías y modernizando la terminología para reflejar los avances realizados en el estudio del sueño durante esos años. Además, a diferencia de la versión revisada de la ICSD-1, en la que el sistema de clasificación se basaba en tres ejes (diagnóstico del trastorno, procedimientos para detectar el trastorno y condiciones médicas y psiquiátricas asociadas al trastorno), el sistema de clasificación de la ICSD-2 se basó solo en un eje, a saber, el diagnóstico del trastorno, y se centró más en los trastornos, proporcionando información exhaustiva de cada uno de estos para facilitar su correcta identificación y tratamiento. Dados los importantes avances en el diagnóstico y tratamiento de estos trastornos en los últimos 20 años, en 2014 y 2023 se publicaron una tercera edición y una versión revisada, respectivamente, para incluir nuevos trastornos, nuevos conocimientos sobre los ya existentes y nueva terminología.

El objetivo de este artículo es describir brevemente las principales contribuciones de la ICSD a la comprensión, el diagnóstico y el tratamiento de los trastornos del sueño, haciendo hincapié en la ICSD-3-TR. También pretende explorar la evolución de la ICSD, como la importancia de su uso en la práctica clínica.

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Corresponding author: Franklin Escobar-Córdoba. Departamento de Psiquiatría, Facultad de Medicina, Universidad Nacional de Colombia. Bogotá DC. Colombia. E-mail: feescobarc@unal.edu.co.

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Introduction

Having a standardized classification of sleep disorders is fundamental to improving diagnosis and timely treatment rates, guiding public health policies on sleep health, and promoting research in the field of sleep medicine. Moreover, it is essential to ensure the provision of effective and high-quality medical care to individuals suffering from these disorders.[1]

Currently, three classifications of sleep disorders are accepted and recognized worldwide, namely:

1. The International Classification of Sleep Disorders, Third Edition, Text Revision (ICSD-3-TR), published by the American Academy of Sleep Medicine (AASM). This classification system is the most used by sleep medicine specialists in sleep centers and clinics.[1]
2. The Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition, Text Revision (DSM-5-TR), is a standard classification of mental disorders published by the American Psychiatric Association (APA).[2] The DSM-5-TR is used by mental health professionals as it provides diagnostic criteria and descriptions of internationally recognized mental disorders. Additionally, it includes a chapter on the classification of sleep disorders that is intended to be used by mental health professionals and general practitioners. Sleep-wake disorders are classified into 10 disorders or disorder groups: insomnia disorder, hypersomnolence disorder, narcolepsy, breathing-related sleep disorders, circadian rhythm sleep-wake disorders, non-rapid eye movement (NREM) sleep arousal disorders, nightmare disorder, rapid eye movement (REM) sleep behavior disorder, restless legs syndrome, and substance/medication-induced sleep disorder. The information provided in this chapter is designed to help identify differential diagnoses for sleep-wake disorders and determine when the patient should be referred to a sleep specialist for further assessment and treatment planning.[2]
3. The International Classification of Diseases, 11th Revision (ICD-11) is the standard classification of the World Health Organization (WHO) for diseases, health disorders, and other related health problems.[3] The ICD-11, published in 2018, is the latest revision of this classification and is widely used worldwide for epidemiological, administrative, and clinical purposes as it provides a coding system to classify diseases and health issues.[3] This classification system includes a wide array of medical conditions, both physical and mental, and establishes diagnostic criteria for each of these conditions.[3] The section addressing sleep disorders is found in Chapter 6 under the title Sleep-Wake Disorders, where the classification of sleep-related disorders, as well as their diagnostic criteria and classification codes are included. The ICD-11 includes sleep disorders such as insomnia, sleep apnea, restless legs syndrome, and circadian rhythm sleep-wake disorders.[3]

Ideally, any classification of sleep disorders should be based on their pathophysiology, but this information is still unclear or unknown for most of these disorders. Therefore, classification systems employ a hybrid approach that considers pathophysiological and phenomenological characteristics. Among these three, the International Classification of Sleep Disorders (ICSD) has emerged as the standard framework for the diagnosis and treatment of these disorders, offering clear diagnostic criteria and standardized terminology.

Taking this into account, the objective of this article is to briefly describe the main contributions of the ICSD to the understanding, diagnosis, and treatment of sleep

disorders, with an emphasis on the ICSD-3-TR (Table 1). It also aims to explore both the evolution and importance of the ICSD and the importance of its use in clinical practice.

Table 1. Classifications of sleep disorders.

Year	Issuing organization	Classification
1979	ASDC, APSS	DCSAD
1990	ASDA, ESRS, JSSR, LASS.	ICSD-1, Diagnostic and coding manual
1997	ASDA, ESRS, JSSR, LASS.	ICSD, revised edition: Diagnostic and coding manual
2001	ASDA, ESRS, JSSR, LASS.	ICSD, revised edition: Diagnostic and coding manual
2005	AASM	ICSD-2
2014	AASM	ICSD-3
2019	WHO	ICD-11
2022	APA	DSM-5-TR
2023	AASM	ICSD-3-TR

AASM: American Academy of Sleep Medicine; ASDA: American Sleep Disorders Association; ASDC: Association of Sleep Disorders Centers; APA: American Psychiatric Association; APSS: Association for the Psychophysiological Study of Sleep; DCSAD: Diagnostic Classification of Sleep and Arousal Disorders; DSM-5-TR: Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition, Text Revision; ESRS: European Sleep Research Society; JSSR: Japanese Society of Sleep Research; ICD-11: International Classification of Diseases, 11th Revision; ICSD-1: International Classification of Sleep Disorders, 1st edition; ICSD-2: International classification of sleep disorders. Version 2; ICSD-3: International classification of sleep disorders. Version 3; ICSD-3-TR: International Classification of Sleep Disorders 3rd Edition, Text Revision; LASS: Latin American Sleep Society; WHO: World Health Organization.

A brief overview of sleep disorder research

Sleep disorders started to be studied in the early 20th century following the development of the electroencephalogram (EEG), a test that allows differentiating sleeping from waking states. Although the first EEG recording from a mammal was published in 1912 by Ukrainian physiologist Vladimirovich Pravdich-Neminsky,[4,5] the modern history of EEG began with the research of German physiologist and psychiatrist Hans Berger, who conducted pioneering experiments involving the recording of electrical currents generated by human brain activity, proving that detecting and recording these electrical signals was possible using electrodes placed on the scalp.[4,6-8] In fact, Berger recorded the first EEG in a human in 1924 and replaced Neminsky's hybrid Greek-Latin term "electrocerebrogram" with the entirely Greek name, "electroencephalogram".[4,5,7,8]

The advent of EEG technology enabled the study of deep sleep at a large scale, as physicians were previously only able to study the manifestations of sleep disorders during wakefulness.[6] This was followed by the discovery of REM sleep between 1953 and 1957.[9] Since then, new findings regarding the neurophysiology and biochemistry of the sleep-wake cycle have increased, leading to significant developments in the diagnosis and treatment of sleep disorders in the 21st century, when sleep medicine was finally acknowledged as a vital component of healthcare.[10]

In 1937, Loomis *et al.*[11] were among the first to classify sleep stages based on EGG patterns. Then, in 1968, Rechtshaffen and Kales developed the first standardized scoring parameters to measure sleep stages and respiratory events in polysomnographic studies.[12] Initially, the study of sleep was primarily conducted by psychiatrists such as Kales, but specialists from other medical and health specialties, such as internal medicine, pulmonology, neurology, psychology, otolaryngology, anesthesiology, and dentistry, have become

involved in this field of study. This interest across multiple specialties has emerged due to the importance of sleep in various domains of human functioning, making necessary an interdisciplinary approach to the assessment and treatment of sleep disorders.[13]

History of the International Classification of Sleep Disorders

The development of an ICSD has been crucial in understanding and clinically managing sleep-wake cycle alterations. A brief account of the ICSD is presented below.

1960 - 1970: There was a substantial increase in the amount of research conducted on both sleep and sleep disorders during this period. Pioneering studies by researchers such as Kleitman and Dement laid the foundations for the physiological understanding of sleep and its disorders.[14]

1979: The Association of Sleep Disorders Centers (ASDC) developed the first consensus-based classification of sleep disorders and published it under the name of Diagnostic Classification of Sleep and Arousal Disorders (DCSAD),[15] providing the first systematization of an ICSD and the first framework for the identification and classification of sleep disorders.

1990: The first edition of the ICSD (ICSD-1) was published by the American Sleep Disorders Association (ASDA), which would subsequently merge with the ASDC to form the American Academy of Sleep Medicine (AASM). This update of the DCSAD included clearer and more uniform diagnostic criteria, as well as standardized terminology to describe sleep disorders.[16] This classification was the result of the joint efforts of major international sleep societies at that time, comprising the ASDA, the European Sleep Research Society (ESRS), the Japanese Society of Sleep Research (JSSR), and the Latin American Sleep Society (LASS).[17]

2005: The AASM published the second edition of the ICSD (ICSD-2),[18] offering a significant update and expansion of the first edition. This edition introduced new categories and diagnostic criteria for various sleep disorders such as insomnia, which was divided into 11 different subcategories. The ICSD-2 delivered a more detailed and precise structure for the identification and classification of sleep disorders. Primary snoring was no longer considered a parasomnia and instead was included in the isolated symptoms, apparently normal variants, and unresolved issues category.[17,18]

2014: The AASM published the third edition of the ICSD (ICSD-3).[19] This revision provided further updates and reflected the progress made in the understanding of sleep disorders since the publication of the ICSD-2.

2023: A group of American and international experts in sleep medicine worked together to revise the ICSD-3 (ICSD-3-TR). This version has been available since June 2023.[1]

The first classification of sleep disorders

In 1979, The ASDC,[15] an association of sleep medicine experts, created the first consensus-based classification system for sleep-wake disorders in order to establish a common framework for identifying and classifying sleep-wake disorders. This classification system, known as DCSAD, organized sleep disorders into symptomatic categories and was a milestone for sleep medicine as it provided a structured and uniform basis for understanding and addressing sleep disorders. This allowed healthcare professionals to consistently categorize several sleep disorders, making the diagnosis and treatment of patients with these disorders easier.

It is worth noting that this consensus-based classification system was achieved through a collaborative effort involving experts in sleep medicine, neurology, psychiatry, and general medicine.[10] This interdisciplinary collaboration was fundamental to ensure that the classification system was widely accepted and used in clinical practice settings. The latter aspect is particularly important as the DCSAD was the basis for the current classification systems of sleep disorders.[17]

The International Classification of Sleep Disorders: first edition and revised edition

In 1990, the ASDA, in collaboration with the ESRS, the JSSR, and the LASS, released the ICSD-1 as an update of the DCSAD.[16] This classification system was developed mainly for diagnostic, epidemiologic, and research purposes at that time.[17] Furthermore, in addition to offering a clearer diagnostic criteria, the ICSD-1 had a more standardized terminology to describe sleep disorders, greatly contributing to the improvement of international communication in sleep disorder research.[17]

The ICSD-1 differentiated primary sleep disorders from sleep disorders secondary to medical or psychiatric conditions, further subdividing the former into two categories: dyssomnias and parasomnias. There are four main categories in total:[17,20]

Dyssomnias

- Intrinsic sleep disorders: including idiopathic insomnia, post-traumatic hypersomnia, obstructive sleep apnea, restless legs syndrome, and periodic limb movement disorder.
- Extrinsic sleep disorders: including inadequate sleep hygiene, environmental sleep disorder, sleep-onset association disorder, and nocturnal eating-drinking syndrome.
- Circadian rhythm sleep disorders: including irregular sleep-wake patterns, jet lag, advanced sleep phase syndrome, and delayed sleep phase syndrome.

Parasomnias

- Arousal disorders: confusional arousals, sleepwalking, sleep terrors.
- Sleep-wake transition disorders: rhythmic movement disorder, sleep starts, sleep talking, nocturnal leg cramps.
- Parasomnias usually associated with REM sleep, including: nightmares, sleep paralysis, REM sleep-related sinus arrest, REM sleep behavior disorder.
- Other parasomnias, including: bruxism (teeth grinding), sleep enuresis, and benign neonatal sleep myoclonus.

Sleep disorders associated with mental, neurologic, or medical disorders

- Associated with mental disorders: psychoses, mood disorders, anxiety disorders, and panic disorders.
- Associated with neurologic disorders: cerebral degenerative disorders, parkinsonism, fatal familial insomnia, sleep-related epilepsy, and sleep-related headaches.
- Associated with other medical disorders: sleep-related asthma, sleep-related gastro-esophageal reflux, fibromyalgia, nocturnal cardiac ischemia.

Proposed sleep disorders

- Shorter sleeper, long sleeper, menstrual-associated sleep disorders, terrifying hypnagogic hallucinations, and sleep hyperhidrosis.

However, this classification had multiple limitations. For example, given the rapid progress of research on sleep and associated disorders, many sleep disorders identified shortly after the initial publication were not included, since the revised edition was released several years later. Additionally, some of its diagnostic criteria lacked specificity to reach a precise diagnosis. Despite its limitations, the ICSD-1 was a pivotal step in the development of subsequent classification systems of sleep disorders.[16]

A revised version of the ICSD-1, which expanded its classification by introducing new subgroups encompassing around 100 disorders, was published in 1997.[21,22] The purpose of this revision was to incorporate the advances made in sleep research since 1990, classifying sleep disorders based on three axes: the diagnosis of the disorder, the diagnostic procedures to detect the disorder, and the medical and psychiatric conditions associated with the disorder.[22,23] The axial classification system comprises Axis A, the first level, which includes sleep-disorder diagnoses, modifiers, and associated code numbers; Axis B, the second level, which details sleep-related procedures, their features, and associated code numbers; and Axis C, the third level, which refers to ICD-9-CM non-sleep diagnoses and associated code numbers.[22]

Finally, in the 1997 revised version of the ICSD, sleep disorders are classified into four main categories, which are further divided into subcategories encompassing different sleep disorders. The classification outline is presented below:[22]

1. Dyssomnias

A. Intrinsic sleep disorders
B. Extrinsic sleep disorders
C. Circadian rhythm-related sleep disorders

2. Parasomnias

A. Arousal disorders
B. Sleep-wake transition disorders
C. Parasomnias usually associated with REM sleep
D. Other parasomnias

3. Sleep disorders associated with mental, neurologic, or other medical disorders

A. Associated with mental disorders
B. Associated with neurological disorders
C. Associated with other medical disorders

4. Proposed sleep disorders

A. Shorter sleeper
B. Long sleeper
C. Menstrual-associated sleep disorders

The International Classification of Sleep Disorders, second edition

In 2005, the American Academy of Sleep Medicine (AASM) published the second edition of the ICSD (ICSD-2).[18] This edition presented a significant update and expansion of the original classification, as it was developed to include the progress made in the understanding of sleep disorders since the publication of the first edition revision. The ICSD-2 had a better structure for classifying a wide array of sleep disorders, listing a total of 81 sleep disorders across 8 categories with a descriptive diagnostic text that includes specific diagnostic criteria. Moreover, 13 diagnostic items that include sleep disorders associated with other disorders classifiable elsewhere, were listed in the appendices, as well as psychiatric disorders frequently considered in the differential diagnosis of sleep disorders.[17,18]

According to Gállego Pérez-Larraya,[23] the ICSD-2 returned to the traditional clinical diagnosis approach by prioritizing the main symptoms or the types of disorders that occur during sleep.[18] The aim of this second edition was, based on clinical and scientific data, to provide a structured, rational, and valid classification of sleep disorders that was as compatible as possible with the ICD-9 and ICD-10. With this in mind, the ICSD-2 focused on sleep disorders over diagnostic procedures, providing detailed information on each sleep disorder and including information such as alternative names, main characteristics, added features, demographics, family patterns, precipitating and predisposing factors, pathophysiology, polysomnography and other test findings, diagnostic criteria, subtypes, unresolved issues and future directions, and differential diagnoses.[22,23]

Furthermore, the classification of sleep disorders in this edition was based only on one axis: the diagnosis of the disorder. Accordingly, codes of axes B and C in the first edition were removed. This second edition also discouraged the use of the word “dyssomnia”, considering it unsuitable for describing a symptom that is a combination of symptoms.[18,23]

As mentioned above, the ICSD-2 includes 81 major disorders divided into 8 major categories, as follows:[17,18]

1. Insomnias.
2. Sleep-related breathing disorders.
3. Hypersomnias of central origin.
4. Circadian rhythm sleep disorders.
5. Parasomnias (subdivided into two categories: parasomnias and other parasomnias).
6. Sleep-related movement disorders.
7. Isolated symptoms, apparently normal variants, and unresolved issues.
8. Other sleep disorders.

In addition, 13 diagnostic items were included in the following two categories:[17,18]

1. Sleep disorders associated with conditions classifiable elsewhere.
2. Other psychiatric/behavioral disorders frequently encountered in the differential diagnosis of sleep disorders.

Each of these categories are discussed in individual chapters that provide specific diagnostic criteria, detailed clinical descriptions of the disorders included, and guidelines for their evaluation and treatment.[18] This edition also updated the terminology used to describe sleep disorders to improve communication between physicians and to standardize data for research purposes.[17]

International Classification of Sleep Disorders, third edition

In 2014, the AASM published the third edition of the ICSD (ICSD-3) as a revision of both the ICSD-1 and the ICSD-2).[19] This edition was developed to serve as a comprehensive guide to identifying various sleep disorders by covering key aspects such as their pathogenesis, prognosis, course, and heritability. Specific revised diagnostic criteria and detailed descriptions of sleep disorders are also available in this edition.[19]

The main contributions of the ICSD-3 are the inclusion of new sleep disorders with comprehensive information about them (diagnostic criteria, clinical descriptions, etc.); the reclassification of some existing sleep disorders; the discussion of areas of uncertainty regarding clinical characteristics, pathophysiology, and treatment response of several sleep disorders; the revision of diagnostic criteria for many disorders; and an update of the terminology to be used in this field of study.[19,24] Furthermore, key changes from the ICSD-2 include the consolidation of chronic insomnia as a single disorder and the division of narcolepsy into type 1 and type 2.[24]

As in previous editions, sleep disorders are classified into several categories, with each category discussed in an individual chapter that outlines specific diagnostic criteria, clinical descriptions, and guidelines for the evaluation and treatment of the disorders.[19] The structure of the ICSD-3 was similar to that of the ICSD-2, but including only seven major categories: insomnia disorders, sleep-related breathing disorders, central disorders of hypersomnolence, circadian rhythm disorders, sleep-related movement disorders, parasomnias, and other sleep disorders.

Likewise, two appendices are included: sleep-related medical and neurological disorders and ICD-10-CM coding for substance-induced sleep disorders. Furthermore, significant modifications were made to the nosology of insomnia, narcolepsy, and parasomnias.[19,24]

International Classification of Sleep Disorders, Third Edition, Text Revision

In light of the rapid growth in the knowledge and understanding of sleep disorders, the AASM Board of Directors assembled a group of clinical experts and researchers to revise the text of the ICSD-3. This resulted in the publication of an updated version (ICSD-3-TR) in 2024, which is now regarded as the text of reference for diagnosing sleep disorders.[1] The development of the ICSD-3-TR was based on a comprehensive review of the current literature, and this version, in addition to implementing some minor corrections and modifications in the diagnostic criteria, introduces new and updated information in each chapter.[1]

The most noteworthy modifications with respect to the ICSD-3 include updated diagnostic criteria, clarification of definitions, new clinical recommendations, elimination of redundant criteria, and integration of new findings mainly for the following disorders: chronic insomnia disorder, criterion F; treatment-emergent central sleep apnea; sleep-related hypoxemia disorder; and narcolepsy, type 1, criterion B.[1]

With the exception of two disorders, the names and classification of the disorders in the ICSD-3 were preserved in the revised version. The two disorders are sleep-related leg cramps, now termed nocturnal muscle cramps, and sleep enuresis, which was replaced by sleep-related urologic dysfunction, a disorder subcategory that includes nocturnal urinary urge incontinence and nocturia.[1] Consequently, this version classifies disorders into seven main categories. In addition, two appendices with information about sleep-related medical and neurological disorders, together with ICD-10 and ICD-11 diagnosis codes, are included.[1,3] The structure of the ICSD-3 (main categories and appendices) is presented in Table 2.

Table 2. Structure of the International Classification of Sleep Disorders, third Edition, text revision.

Sections	Description
1. Insomnia disorders	Disorders related to difficulty falling asleep or staying asleep.
2. Sleep-related breathing disorders	Respiratory disturbances that occur during sleep, such as sleep apnea and hypopnea.
3. Central disorders of hypersomnolence	Disorders characterized by excessive daytime sleepiness, for example narcolepsy.
4. Circadian rhythm sleep-wake disorders	Alterations in individuals' natural sleep-wake cycle.
5. Parasomnias	Sleep disorders involving abnormal behaviors, such as sleepwalking and night terrors, or phenomena occurring during sleep, such as nightmares or sleep paralysis.
6. Sleep-related movement disorders	Disorders involving involuntary movements that do not allow sleep onset or disturb sleep, such as restless legs syndrome.
7. Other sleep disorders	Variety of sleep disorders that do not easily fit into the other main categories.
Appendix A: Sleep-related medical and neurological disorders	Information about sleep-related medical and neurological disorders.
Appendix B: International Classification of Diseases (ICD) Coding	ICD-10 and ICD-11 diagnosis codes of sleep-related medical and neurological disorders.

Source: Own elaboration based on American Academy of Sleep Medicine.[1]

This structure offers a comprehensive framework for understanding and classifying a wide range of sleep disorders, thus facilitating their diagnosis and treatment by healthcare professionals. Each category is further divided into subcategories and specific disorders.[1] This classification encompasses diagnostic criteria for each disorder, as well as data on their epidemiology, etiology, clinical course, and guidelines for treatment. Table 3 illustrates an example of the headings used to present information on each disorder.[2]

Table 3. ICSD-3-TR text headings used for the description of sleep disorders.

Alternate Names	**Onset, course, and complications** This section includes: • Medical • Neurological • Psychiatric / Social
Diagnostic criteria Specific signs and symptoms that must be met to set up the diagnosis.	**Developmental issues** Specific clinical characteristics related to age. This section includes: • Pediatric • Geriatric
Essential features Extended criteria necessary for diagnosis	**Clinical and pathophysiological subtypes** Named subtypes.
Associated features Added signs, symptoms, and disorders that are commonly observed in patients with the diagnosis.	**Demographics** This section includes: • Prevalence • Gender bias • Racial/ethnic bias • Cultural issues

Table 3. ICSD-3-TR text headings used for the description of sleep disorders. (Continued)

Predisposing and precipitating factors This section includes: • Risk factors • Predisposing and precipitating factors, which may be temperamental, environmental, genetic, anatomical, or physiologic.	**Pathology and pathophysiology** **Objective findings** This section includes: • Sleep logs • Actigraphy • Questionnaires • Polysomnography • Multiple sleep latency test • Neurological o Electroencephalogram o Cerebrospinal fluid o Neuroimaging o Electromyogram o Autonomic • Endocrine • Genetic testing • Physical findings • Respiratory o Arterial blood gas o Pulmonary function o Ventilatory response • Cardiac o Electrocardiogram o Echocardiogram o Cardiac catheterization • Metabolic/serum chemistry
Familiar Patterns This section includes: • Genetics • Familial clusters	**Differential Diagnosis**
	Unresolved issues and Future directions

Lastly, it should be noted that the ICSD-3-TR, which is mainly used in sleep centers for clinical, academic, and research purposes,[1] differs significantly in terms of structure from the classification available in the sleep disorders chapter of the DSM-5-TR,[2] which is commonly used by psychiatrists and mental health specialists. However, given its characteristics, the former is currently considered as an essential reference for clinicians and researchers to accurately diagnose sleep disorders, as well as a valuable tool for sleep medicine specialists and other healthcare professionals interested in the study of sleep disorders.[1]

A recap of the history of the International Classification of Sleep Disorders and its importance for clinical practice

The ICSD-1[11] was published in 1990 as an updated version of the DCSAD, the first consensus-based classification of sleep disorders developed jointly in 1979 by a group of experts from all over the world.[15] Then, in 1997, a text revision of the ICSD-1 was issued, presenting an updated and expanded the classification based on three axes: the diagnosis of the disorder, the diagnostic procedures to detect the disorder, and the medical and psychiatric conditions associated with the disorder.[22]

A second edition (ICSD-2), published in 2005, introduced the use of categories and subcategories for a better systematization of sleep disorders, as well as comprehensive information about them.[18] However, given the rapid progress in the field of sleep medicine

and the diagnosis and treatment of sleep disorders, new editions and revisions have been necessary over the past two decades, resulting in the publication of the ICSD-3[19] in 2014 and a revised version in 2023.[1]

Since its first edition, the ICSD has become a fundamental tool for diagnosing and treating sleep disorders. Moreover, the inclusion of specific diagnostic criteria, detailed clinical descriptions, and guidelines for the assessment and treatment of each disorder in the second and later editions has greatly contributed to the reduction in the variability of the diagnosis of sleep disorders, which is crucial for patient care.

Ongoing revisions and updates of this classification, such as the ICSD-3-TR, will improve the classification system by aligning it with new research findings, developments in the diagnosis and treatment of sleep disorders, and emerging clinical needs. For example, it is highly likely that a forthcoming ICSD-4 will include information about sleep disorders secondary to COVID-19 and long COVID. This constant updating process ensures that the classification remains clinically relevant, improving the quality of care provided to patients with these disorders considering that, based on the latest evidence, it will continue ensuring accurate diagnoses of sleep disorders.

Final remarks

Any classification of sleep disorders should be based on their pathophysiology, butfor most of them, this information is still unclear or unknown. Consequently, classification systems opt for a hybrid approach that combines pathophysiological and phenomenological characteristics. The ICSD has become the standard framework for diagnosing and treating sleep disorders, offering clear diagnostic criteria and standardized terminology. In this sense, it is recommended that sleep centers fully implement the ICSD-3 and that sleep medicine researchers continue to use it as the gold standard.

Conclusion

The ICSD is essential in the management of sleep disorders, as it provides clinicians and researchers with a standardized framework for their appropriate understanding, diagnosis, and treatment. Its history reflects the progress made, both in scientific and clinical terms, in the study of sleep and its disorders, as well as the importance of ongoing collaboration and interdisciplinary work in this branch of medicine.

Conflicts of interest

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References

1. American Academy of Sleep Medicine (AASM). The AASM International Classification of Sleep Disorders - Third Edition, Text Revision (ICSD-3-TR). Darien: AASM; 2023 [cited 2025 Jul 7]. Available from: https://bit.ly/4eMCwcH.
2. American Psychiatric Association (APA). Diagnostic And Statistical Manual of Mental Disorders, Text revision (DSM-5-TR). 5th ed. Washington D.C.: APA; 2022. doi: 10.1176/appi.books.9780890425787.
3. World Health Organization (WHO). International Classification of Diseases 11th Revision (ICD-11). Geneva: WHO; 2019.
4. Tassinari CA. An electroencephalographer recalls the history of the Federation on the 70th anniversary of its journal, Clinical Neurophysiology. Clin Neurophysiol. 2019;130(12):2258-63. doi: 10.1016/j.clinph.2019.10.010. PMID: 31761715.
5. Cherninskyi A, Hermann DM, Lukyanetz E, Krishtal O. Editorial: Global excellence in cellular neuropathology: Ukraine. Front Cell Neurosci. 2024;17:1354398. doi: 10.3389/fncel.2023.1354398. PMID: 38269117; PMCID: PMC10806996.
6. Caeira MW, Caboclo LO, Paola L. An appraisal to Hans Berger by the time of his 150th birthday: the human EEG and tales of blood flow, heat, and brain waves. Arq Neuropsiquiatr. 2023;81(12):1163-8. doi: 10.1055/s-0043-1777114. PMID: 38157882; PMCID: PMC10756801.
7. Ahmed OJ, Cash SS. Finding synchrony in the desynchronized EEG: the history and interpretation of gamma rhythms. Front Integr Neurosci. 2013;7:58. doi: 10.3389/fnint.2013.00058. PMID: 23964210; PMCID: PMC3740477.
8. Stone JL, Hughes JR. Early history of electroencephalography and establishment of the American Clinical Neurophysiology Society. J Clin Neurophysiol. 2013 Feb;30(1):28-44. doi: 10.1097/WNP.0b013e31827edb2d. PMID: 23377440.
9. Aserinsky E, Kleitman N. Regularly occurring periods of eye motility, and concomitant phenomena, during sleep. Science. 1953;118(3062):273-274. doi:10.1126/science.118.3062.273.
10. Shepard JW Jr, Buysse DJ, Chesson AL Jr, Dement WC, Goldberg R, Guilleminault C, *et al.* History of the development of sleep medicine in the United States. J Clin Sleep Med. 2005;1(1):61-82. PMID: 17561617; PMCID: PMC2413168.
11. Loomis AL, Harvey EN, Hobart GA. Cerebral states during sleep, as studied by human brain potentials. Journal of experimental psychology. 1937;2:127-44. doi: 10.1037/h0057431.
12. Rechtschaffen A, Kales A, editors. A manual of standardized terminology, techniques and scoring system for sleep stages of human subjects. Wasington D.C.: Public Health Service, U.S. Government Printing Office; 1968.
13. Sedky K, Nazir R, Bennett D, editors. Sleep Medicine and Mental Health. A Guide for Psychiatrists and Other Healthcare Professionals. Cham: Springer Nature Switzerland; 2020.
14. Dement WC. Remembering Nathaniel Kleitman. Arch Ital Biol. 2001;139(1-2):11-7. PMID: 11256180.
15. Diagnostic classification of sleep and arousal disorders. 1979 first edition. Association of Sleep Disorders Centers and the Association for the Psychophysiological Study of Sleep. Sleep. 1979;2(1):1-154. PMID: 531417.
16. American Sleep Disorders Association. Diagnostic Classification Steering Committee. The International Classification of Sleep Disorders: Diagnostic and Coding Manual (ICSD). Rochester: American Sleep Disorders Association; 1990.
17. Thorpy MJ. Classification of sleep disorders. Neurotherapeutics. 2012;9(4):687-701. doi: 10.1007/s13311-012-0145-6. PMID: 22976557; PMCID: PMC3480567.
18. American Academy of Sleep Medicine (AASM). International Classification of Sleep Disorders: Diagnostic and Coding Manual (ICSD-2). 2nd ed. Westchester: AASM; 2005.
19. American Academy of Sleep Medicine (AASM). International Classification of Sleep Disorders. 3rd ed. Darien: AASM; 2014.
20. Kotagal S. Sleep disorders in childhood. Neurol Clin. 2003;21(4):961-81. doi: 10.1016/s0733-8619(03)00034-3. PMID: 14743660.
21. Escobar-Córdoba F. Somnolencia diurna excesiva e insomnio: males de los tiempos modernos. Bogotá D.C.: Universidad Nacional de Colombia; 2020.
22. American Sleep Disorders Association. The International Classification of Sleep Disorders: Diagnostic and Coding Manual. Rochester: American Sleep Disorders Association; 1997.
23. Gállego Pérez-Larraya J, Toledo JB, Urrestarazu E, Iriarte J. Clasificación de los trastornos del sueño. An. Sist. Sanit. Navar. 2007;30(Supl. 1):19-36.
24. Sateia MJ. International classification of sleep disorders-third edition: highlights and modifications. Chest. 2014;146(5):1387-94. doi: 10.1378/chest.14-0970. PMID: 25367475.