

A COMPREHENSIVE REVIEW ON THE PHYSIOLOGY OF NIDRA AND SWAPNA:
INSIGHTS FROM AYURVEDA AND MODERN SCIENCEDr. Vaibhav Biradar^{1*}, Dr. Nishant Patel² and Dr. Arpit Vankar³¹Head of Department and Professor, Department of Kriyasharir, Parul Institute of Ayurved and Research, Parul University, Vadodara Gujarat.²Assistant Professor, Department of Kayachikitsa, Parul Institute of Ayurved, Parul University Vadodara Gujarat.³Assistant Professor, Department of Kayachikitsa, Shridhar Atulkumar Jani Ayurvedic Medical College and Hospital, Amreli Gujarat.

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ABSTRACT

Ahara, **Nidra**, and **Brahmacharya** are central pillars in Ayurveda, critically supporting physical and mental health. Among these, **Nidra** (sleep) is particularly essential in today's fast-paced world. Defined in Ayurvedic texts as the restorative state for the **Sharira** (body), **Mana** (mind), and **Indriya** (senses), its deficiency leads to conditions like primary **Anidra** (insomnia), increasing the risk of numerous clinical disorders and, over time, chronic sleep disturbances.^[1] **Aim:** To explore **Nidra**'s Ayurvedic definition, classifications, and physiological impact. **Materials & Methods:** A comprehensive review of Ayurvedic Samhitas and modern literature from PubMed and Google Scholar, using keywords such as "physiology of Nidra" and "sleep." **Conclusion:** Ayurveda recognizes Nidra as one of life's three core pillars, offering detailed guidance on its types and functions. Recognizing and researching sleep remains key to diagnosing and preventing sleep-related disorders.

KEYWORDS: Manas, Sleep, Ayurved, Indriya.

INTRODUCTION

Ayurveda designates **Ahara**, **Nidra**, and **Brahmacharya** as **Trayopastambha**, literally "three supporting pillars." This term combines *traya* (three) with *upastambha* (supporting pillar) derived from *upastambhana* ("that which holds up").^[2] Sleep alone occupies almost one-third of human life, playing a vital role in mental and physical equilibrium.^[3]

Nidra is marked by closed eyes, reduced responsiveness, and diminished bodily activity—a physiological state of rest. It naturally arises from the night-time dominance of **Tama guna**, coupled with mental and cognitive relaxation. According to Ayurvedic physiology, when the **Manovaha Srotas** (mind channels) are laden with **Sleshma** (Kapha), and the mind becomes fatigued, sensory perception withdraws, leading to sleep.^[2]

MATERIALS AND METHODS

This study is grounded in classical Ayurvedic texts (Charaka Samhita, Susruta Samhita, Aṣṭāṅga Hṛdaya, Aṣṭāṅga Saṅgraha) and contemporary research sourced via PubMed and Google Scholar using targeted search terms.

DEFINITION OF NIDRA

- The *Mandukya Upanishad* defines deep sleep (*susupti*) as the absence of dream and desire in the *Atma*.^[3]
- *Caraka* states that sleep occurs when sensory-motor faculties and the integrative mind experience fatigue.⁴
- *Susruta* posits that sleep arises when **Tamas** veils the *Hridaya*—the seat of consciousness⁵.

Modern Definition

Sleep is viewed as a temporary, reversible state of reduced consciousness, from which a person can be awakened by sensory stimuli.

MECHANISM OF NIDRA

- According to *Susruta*, when **Tama guna** dominates, *Hridaya* is enveloped, inducing sleep; conversely, **Satva guna** fosters wakefulness.⁶
- *Caraka* attributes sleep to fatigue involving the mind and sensory-motor systems.⁷
- *Aṣṭāṅga Saṅgraha* explains that sensory withdrawal and mind detachment from the senses, due to

Sleshma accumulation in the *Manovaha Srotas*, initiate sleep.⁸

- *Śārṅgadharma* notes that increased Kapha and Tamo guna lead to Nidra.⁹

CORRESPONDING MODERN PHYSIOLOGY

During Non-REM sleep, the brain's ATP consumption drops significantly. This shift supports energy conservation and restoration. Slow-wave sleep triggers **growth hormone (GH)** pulses and enhances **prolactin** release, even during daytime naps.^[1]

TYPES OF NIDRA

Ayurvedic texts classify Nidra's variations intricately:

- **Aṣṭāṅga Hṛdaya**
 - *Mithyā-yogaroopa* (improper timing)
 - *Atiyoga-roopa* (excessive sleep)
 - *Hinayogaroopa* (insufficient sleep)
 - *Samyaka-yogaroopa* (properly timed sleep).^[11]
- **Aṣṭāṅga Saṅgraha** describes seven types: *kāla-svabhāva*, *amayaja*, *chittākedobhāva*, *dehākedobhāva*, *kro'dhobha*, *agantubha*, and *tamobhava*.^[12]
- **Susruta** recognizes three primary types.
 - *Vaiṣṇavi Nidra*—natural, nourishing sleep
 - *Vaikariki Nidra*—pathogenic, due to Kapha/Vata imbalance
 - *Tamasi Nidra*—deep, inertia-dominant sleep, often akin to near-unconsciousness at death.^[13]
- **Caraka Samhita** outlines seven forms linked to dosha and mental states—including *Tamobhāva*, *Sleshma*, *Sharira-śrama*, *Agantuki*, *Vyādhi-anuvartini*, and *Rātri-svabhāva*.¹⁴

Modern correlations suggest.

- *Tamobhāva* mirrors coma-like states
- *Sleshma* matches medication- or substance-induced drowsiness
- *Sharira-śrama* aligns with exhaustion and adenosine-induced sleep
- *Agantuki* represents obscure or obscure sleep—sometimes pre-death
- *Vyādhi-anuvartini* corresponds to infection-induced cytokine sleep
- *Rātri-svabhāva* coincides with natural nocturnal melatonin-regulated sleep¹⁵

MODERN SLEEP CYCLES

Sleep progresses through cycles

- **N1:** brief transition (~10 mins)
 - **N2:** light sleep, with spindles (~20 mins)
 - **N3:** deep slow-wave sleep (delta stage) lasting ~20–40 mins
 - **REM:** begins ~90 minutes in, involving dreaming and muscle paralysis¹⁵
- Each night, individuals experience 4–5 such cycles, vital for restorative physiological and cognitive functions.

NEUROHORMONAL ASPECTS

- **Growth hormone** is released primarily during early N3 (slow-wave) sleep—studies indicate up to 60–70% of daily GH output occurs here.¹⁰
 - One experiment with Gamma-hydroxybutyrate (GHB) demonstrated that doubling N3 sleep led to a near doubling in GH secretion.¹⁶
 - Conversely, restricting deep sleep reduces GH amplitude and delays its release.¹⁷ Delta waves directly stimulate GHRH and prolactin release.¹⁸
- **Melatonin**, secreted by the **SCN** in low light, synchronizes sleep–wake cycles and is inhibited by artificial light exposure.¹⁰

TIMING AND RHYTHM IN AYURVEDA

- Sleep is most appropriate at night when **Tama guna** naturally increases.¹⁶
- Staying awake past dusk unbalances **Vata–Pitta**, leading to digestive, digestive, concentration, and systemic disturbances.^[17–18] If unavoidable, a compensatory daytime nap equal to half the lost sleep is recommended.¹⁸ According to Kaiyadeva Nighantu, sleep should begin roughly six hours after sunset.¹⁹

SLEEP NEED VARIES BY AGE

Ayurveda aligns with modern guidelines

1. **Newborns:** 18–20 h
2. **Children:** 12–14 h
3. **Adults:** 7–9 h
4. **Elders:** 5–7 h²⁰

This echoes doshic influence: Kapha-dominant infancy, Pitta-dominant adulthood, and Vata-dominant elder years contribute to reduced sleep demands.

HYGIENE & POSTURE

- *Yogaratnakara* advises a mindful pre-sleep routine: 100 steps post-dinner, recumbent breathing (8 breaths supine, 16 on the right, 32 on the left), then sleep.^[21]
- Beds should be comfortable—kneel-level mattress, proper pillow support, left lateral sleeping for digestion.^[22]
- Focusing on calm, positive thoughts enhances sleep quality; negative emotions should be avoided.^[22]
- Gentle oil massage (*Samvahana*) prior to bedtime soothes the body and mind, balancing Vata and Kapha.^[23]

DAYTIME SLEEP & NIGHT WORK

- **Divaswapna** (napping) is generally disfavored—condemned by *Susruta* for increasing all doshas.²⁴ Some scholars, however, allow it during summer, infancy, or certain illnesses.^[24–28]
- **Ratrijāgarāṇa** (staying awake all night) is harmful and causes Vata–Pitta imbalance—morning rest before food is prescribed; prolonged practice only avoids harm if one's biology adapts (e.g. night-shift workers).^[2]

SLEEP SUPPRESSION & DISTURBANCES

Suppressing sleep (*Nidrāvegadhāraṇa*) induces yawning, body aches, and mental fog; massage helps restore balance.^[29-32]

- *Nidrānaasha* (insomnia) is linked with Vata–Pitta depletion or injury; treatments include oil massage, body rubs (*Udvaritana*), and nourishment.^[2]
- *Atinidra* (oversleeping) stems from Kapha excess; remedies include purgation (*Virechana*), nasal therapy (*Nasya*), and fasting.^[2]

SIGNIFICANCE

A well-balanced sleep (*Samyak Nidra*) fosters happiness, strength, knowledge, fertility, and longevity—whereas imbalanced sleep contributes to suffering, weakness, ignorance, and premature mortality.^[33-35]

DISCUSSION AND CONCLUSION

Both Ayurveda and modern science highlight the complex importance of sleep—its duration, timing, quality, and endocrine rhythms. While Ayurvedic wisdom offers nuanced classifications and lifestyle interventions, modern research confirms the physiological underpinnings and consequences of sleep disruption. Integrating these insights can prevent chronic ailments ranging from metabolic disorders to mental health challenges. Continued research and clinical application are essential to harness sleep's full therapeutic potential.

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